

REVISED

COURSE OF STUDY

FOR

Teachers' Institutes

Prepared by Authority of the

STATE BOARD OF EDUCATION

OF MISSOURI.

REVISED MAY 15, 1895

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WARRENSBURG, MO.
JOURNAL DEMOCRAT PUBLISHING HOUSE

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INTRODUCTION.

DURING the last two weeks in April the State Superintendent held a series of meetings with the County Commissioners and others interested in the institutes. About half of the Commissioners were able to attend the meetings, many being kept away because their schools were in session. The sentiment of those attending the meetings was nearly unanimous in the support of the following propositions:

1. That the *purpose* of the institute is *not to teach the common school branches*, and that persons ignorant of these branches cannot reasonably hope to master them during the short period that an institute is in session.

2. That the purpose of the institute is pedagogical instruction, the elevation of professional ideals, the direction of professional studies, and the creation of professional sentiment, spirit and enthusiasm.

3. That it is in no sense the purpose of the institute to prepare teachers for passing examinations.

4. That the practice of grading the teachers on their daily recitations and talking every day about grades and examinations is vicious and demoralizing, and ought not to be countenanced or allowed.

5. That while any institute recitation is in progress the entire attention of the instructor and all the class ought to be concentrated upon the subject matter of the lesson.

6. That the examinations at the close of the institute ought not to be confined to the few brief lessons taught during the institute.

7. That in arranging this course of study there should be but one series of lessons in each of the common school branches and one in School Management; that no separate class is needed in methods of teaching; but, that this course should be so arranged that the work done in the treatment of each of the branches will be as far as practicable pedagogical. To illustrate: The purpose of the lessons here given in language is to show how to teach language.

8. That *no one* in the institute should have *more than six* [or at the very outside, *seven*] daily recitations, and that the teacher who pursues a given subject [as, for example, Geography] during this year or any other year should have opportunity to study the methods of teaching the elementary, intermediate, and advanced phases of that subject all during one and the same year.

9. That in classifying the teachers into the three classes [or two] as

heretofore, the basis of classification should be scholarship and professional attainments combined, but the needs of each individual should be considered in determining what subjects he shall take each hour of the day. To illustrate: Some teachers who rank among the best in most subjects, may need to take civil government with the lowest class in the institute.

10. That very great care ought henceforth to be exercised in the classification of certificates, that an applicant should be of undoubtedly high standing *in all the subjects* in this course of study in order to receive a first grade certificate and equally proficient in all except psychology in order to receive the second grade certificate.

The State Board of Education [as provided by statute] appointed a committee of five men to prepare this *Revised Course of Study*. The committee consisted of Supt. W. J. Hawkins of Nevada; Principal F. E. Cook of St. Louis; Prof. Jno. T. Buchanan of Kansas City; Supt. L. J. Hall of Montgomery City and Prof. J. A. Merrill of Warrensburg; the State Superintendent being ex-officio a member.

It is but justice to the committee and others who aided in preparing this outline that the following facts be stated: Our statutes make no provision for the expenses of the committee or for the cost of printing this course of study; All business was done by correspondence; No one received a penny in payment for his services; At the request of members of the committee, valuable assistance was rendered by President W. D. Vandiver of Cape Girardeau; Prof. W. T. Carrington of Springfield; Prof. N. A. Harvey and Principals G. B. Longan and Gertrude Greene of Kansas City. No one had more than one week in which to prepare his part of the course.

It is understood that this course of study is for the current year only. It doubtless has some defects. During the ensuing fall and winter it is proposed that we all put our heads together and devise a plan of operation for the institutes of 1896 that will embody the combined wisdom of all the educational forces in the state.

Very respectfully,

JOHN R. KIRK,
State Superintendent of Public Schools.

LANGUAGE AND GRAMMAR.

BY SUPT. W. J. HAWKINS, NEVADA.

GUIDING PRINCIPLES. (Quoted.)

1. Observation in some form must precede knowledge, and when properly conducted, leads to knowledge.

2. Definite thought must be awakened in the mind before intelligent expression is possible.

3. The pupil must in some rational way be led to associate this thought with word forms (oral or written) for properly expressing it.

4. In the early stages of language teaching, a good drill in observation, accompanied by oral expression, should precede the use of written exercises, printed books, or charts. Thought must be secured through natural methods.

5. Success in teaching language to primary classes depends on the teacher's skill in exciting and maintaining the pupil's interest while directing his mind in definite channels of effort and leading him to be easy and natural in his methods of observation and expression.

LESSON OUTLINES.

I. CONVERSATION AND OBSERVATION.

1. Conversation:—essential points:

(1.) Cultivate the acquaintance of the pupils and lead them to talk with freedom and ease.

(2.) The topics for conversation must be familiar to the pupils.

(3.) The teacher must be interested in the conversation and must be an attentive listener as well as a pleasing talker.

(4.) The conversation lesson must be narrative as well as descriptive, and the topics used, or the objects presented to call out free expressions of thought, must be determined by the locality in which pupils live, and their home influences and environments.

(5.) The conversation lesson must determine, in part at least, the following points: (a) The pupil's vocabulary of spoken words; (b) The correctness of pronunciation and use of words; (c) The character and extent of the pupil's information.

The following lessons are given as examples, and instructors should vary them both as to matter and order as they deem best. The purpose is to present a *plan* for class work.

1. (a) John, where do you live?

I live on the rock road.

How far do you live from the school house?

Father says it is half a mile.

Who is your nearest neighbor?

Our nearest neighbor is the Widow Johnson.

Who is your nearest neighbor on the other side?

Mr. Stokes is our nearest neighbor on the other side.

Combined: I live on the rock road half a mile from the school house. Our nearest neighbor on the one side is the Widow Johnson, and on the other side, Mr. Stokes.

If the pupils cannot combine properly the teacher must help them.

- (b) What does your father do?

He is a farmer.

What does he raise?

He raises wheat, chickens, potatoes, pigs, corn, apples, calves and mules.

Combined: My father is a farmer and raises wheat, corn, apples, potatoes, mules, calves, pigs and chickens.

2. (a) Have you any brothers or sisters?

Yes, ma'am; I have two brothers and one sister.

What are your brothers' names?

Their names are Charley and George.

What is your sister's name?

She is the baby and her name is Bessie.

Combined: I have two brothers and one sister. The names of my brothers are Charley and George. My sister's name is Bessie.

2. Observation.

- (a) Mary, what color is your slate?

My slate is black.

Move your finger on the surface, then tell me something about it?

The surface is smooth.

Why is the surface smooth?

The surface is smooth that I may write on it.

Combined: My slate is black and the surface is smooth that I may write on it.

- (b) About a plant as a whole:

Does this plant grow in doors or out of doors?

That plant grows out of doors?

What conditions are necessary for it to grow?

It must have warm sunshine and moist soil.

What care does it need?

The soil must be cultivated.

Does this plant grow from a slip or from a seed?

That plant grows from a seed.

What is the name of the plant?

It is a bean plant.

Combined: The plant grows out of doors. It must have warm sunshine and moist soil, and the soil must be cultivated. It grows from a seed and is called a bean plant.

Suggestions: (1.) Briefly discuss the essential points given above.

(2.) Take up actual recitations in *conversation* and *observation*—both oral and written, and vary the drills both as to matter and as to method.

II. 1. Spend the first ten minutes in recitations on topics of conversation, or observation work. The recitations should be planned and presented from the stand point of the child and the conclusions should be clear, simple and pointed.

2. Members of the class should have Hyde's First Book, take up the exercises from page 1 to page 10 and give practical lessons showing the use of the book in the hands of the pupils.

Example. Lesson 1.

Lucy, read the first sentence.

Lucy reads: "Tell something about your book."

Lucy's response: "My book is new and clean."

Mary, read the next sentence.

Mary reads: "Tell something about your pencil."

Mary's response: "I have a long pencil."

John, read the next sentence.

John reads: "Tell something about your desk."

John's response: "The desk is too high for me," etc., etc.

Suggestions: The above is only a *plan*; instructors will have others. Hyde's text book is our text by law. Teachers must use it. *Most* in the language class will be young teachers. They must have help and instructors can best help them by doing class work from the book. The above plan involves three things on the part of the pupil—reading, thought getting and oral expression.

III. Observation Lesson and special use of words.

1. The use of *was*, *were*, *has* and *have*.

2. The use of *see*, *saw*, *seen*, *has seen* and *have seen*.

3. Use of singular and plural forms of familiar nouns.

Suggestions: Use familiar objects.

Lead to the correct use of the words in oral discussion, then carefully unite what has been said.

Read, compare and correct errors.

IV. Special study of word forms:

1. Singular and plural forms of nouns used in sentences.
2. Singular and plural use of verbs associated with singular and plural forms of nouns.
3. Ways of forming plurals.
4. Use singular and plural possessives in sentences.
5. Distinguish between forms of adjectives and adverbs.

Suggestions: (a) Study words used by children in every day conversation.

(b) Write the forms as many times as possible.

(c) Deduce the rules from the written forms.

V. *Picture Stories*:

1. Use of picture lessons in the text book: (a) Carefully discuss all points in the outline; (b) Write the story connectedly and in the order of the outline.

2. Use other pictures and lead pencils to develop and arrange the outline.

3. Without outlines write the stories suggested by other pictures.

Objects: Short, clear sentences and well connected stories.

VI. *Reproduction*.

1. Read the story to the class.

(1) The story should be new and short.

(2) It should be about something familiar to the pupils.

(3) The story should be read by the teacher or by a member of the class.

2. Discuss orally all points in the story.

(1) Lead every pupil to take a part in the discussion.

(2) Correct all errors in use of words and construction of sentences.

(3) Take up the points in their order.

3. Write the story on slates or paper.

Read, compare and correct errors.

Discuss: (a) Object and value as a language exercise. (b) Educational value. (c) Abuses.

VII. *Quotations and Dictation exercise*:

1. Quotation marks and their uses.

2. Require several short quotations to be written.

3. Dictations.

(1) Read selected sentences or short selections slowly and distinctly.

(2) Compare and correct in spelling, use of capitals and punctuation.

Discuss: (a) Value of learning quotations. (b) The educational

value of dictation exercises. (c) Faults to be avoided on the part of the teacher.

VIII. Letter Writing:

1. Represent a sheet of paper on the black board.
2. Write a short letter showing the correct position of the parts of the letter.
3. Teach the names of the parts of a letter and put special stress on position, use of capital letters and punctuation.
4. Require members of the class to write a business letter. Compare and correct errors.

IX. Compositions in elementary classes:

1. Study and use of composition outlines in elementary text book.
2. Preparation work.
 - (a) Pupils can write only what they know.
 - (b) Use of the correct form of the oral sentence should precede the use of the written sentence.
 - (c) As oral language precedes written language the oral discussion of the subject must precede the written discourse.
3. Select from subject things as topics familiar to children.
4. Develop the leading facts by careful questioning. In the same way bring out and arrange minor facts.
5. Write the composition, urging correct use of capital letters and punctuation.

X. Study of the compositions:

1. Every set of compositions should be a special study for several lessons.
 - (a) A reading lesson.
 - (b) Choice and use of words.
 - (c) Arrangement of sentences.
2. Insist from the beginning on correct *form* on the paper. The following points are most important (*DeGarmo*):
 - (1) Pupil's name on upper right hand corner.
 - (2) Title in the center of the page and under lined.
 - (3) An even margin at left of page (say one-half inch on note paper.)
 - (4) Indentation of the first line of each paragraph.
 - (5) No margin at right of page, each line being well filled out (except, of course, the last line of a paragraph which may end at any place.)
 - (6) A hyphen at the right to show the division of a word made at the end of a line.
 - (7) A capital letter at the beginning of each sentence.
 - (8) An interrogation point at the close of a question.

- (9) A period at the close of a declarative or imperative sentence.

XI. The study of sentences:

1. Forms.

- (a) Simple. (b) Complex. (c) Compound. Develop the complex and the compound from the simple. Compare the forms.

2. Use:

- (a) Declarative. (b) Imperative. (c) Interrogative. (d) Exclamatory.

3. Elements of a sentence as to rank:

- (a) Principal. (b) Subordinate. (c) Subordinate sentences are in use, Substantive, Adjective, or Adverbial. Illustrations.

XII. Sentences continued:

1. Synthesis. (a) Write simple sentences. (b) Modify the subject by (1) a word. (2) A phrase. (3) A clause. (c) Modify the predicate by (1) a word. (2) A phrase. (3) A clause. (d) Compare the forms and show by reference to definition that the third under (b) and under (c) is each a complex sentence—form other complex sentences. (e) Form numerous combined sentences.

2. Analyze one sentence of each as illustration of powers of analysis.

XIII. Forms of the verbs:

1. Classification of verbs.

- (a) In regard to form—regular and irregular. (b) In regard to use—transitive, intransitive, auxiliary, impersonal.

2. Properties of the verb.

- (a) Voice. (b) Mode. (c) Tense. [d] Person. [e] Number.

Give careful drills on regular and irregular verbs, also on mode and make careful distinction between old and new classification with respect to mode.

XIV. Practical exercises in the use of verbs:

1. On verbs likely to be improperly used, as *lie, raise, set* and *sit*.
2. Use of auxiliaries: *shall, will, may, can, must, could, would, etc.*
3. The uses of the participle in a sentence [a] part of a predicate. [b] As subject. [c] As objective element. [d] As adjective element.

XV. The office of the adverb in the sentence:

1. Joined to verbs, showing manner, time, place, cause, etc.
2. Joined to adjectives to express qualities.
3. Joined to other adverbs to express manner, time, etc.

XVI. Advanced work in composition:

1. Select a subject on which all have some information or may obtain information easily.
2. Orally, develop the main points in the subject.
3. Write the compositions, leaving the members of the class to fill

in the minor points.

XVII. The study of the composition:

1. Spelling, capital letters and punctuation.
2. Choice of words.
3. Construction of sentences.

[a] Contracted or wordy. [b] Concise and clear or loose and obscure. [c] Select one, three or five best sentences and state why they are the best.

XVIII. *The Study of the Composition Continued:*

1. Selection and analysis of [a] simple sentences. [b] Compound sentences. [c] Complex sentences.

2. Select. [a] Transitive verbs. [b] Passive verbs. [c] Verbs in subjunctive mode, etc.

These lessons are outlined not for the purpose of teaching the facts of the subject, but to indicate plans of presentation.

The committee has had in view the needs of the teachers who have had but little or no experience and need methods more than they need facts in technical grammar. Where the lessons are too long for one recitation, the instructors may select such parts of the outline as they deem best.

GEOGRAPHY.

BY PROF. JAS. A. MERRILL, WARRENSBURG.

ASSISTED BY PROF. N. A. HARVEY, KANSAS CITY.

SUGGESTIONS TO THE INSTRUCTOR.

In the outline which follows, strict attention has been given to the logical dependence of the different elements which constitute the subject matter of geography.

The instructor is asked to study it carefully, not with reference to any text-book, but on its own merits. The order of the lessons is not necessarily the natural arrangement of the topics, but since each lesson is largely a line of thought peculiar to itself, it may be studied as a whole. The lessons do not cover the entire field minutely, nor could eighteen lessons be made to do so; but it is thought that the principal elements have been so placed that the spirit of the method may be understood. Much of what is generally put in geography and thought to be of great value is here omitted, not so much because its value is questioned as because its relative value puts it in a different position, so that it needs no emphasis to make it fall in line with the unfolding of the subject.

It will be noticed that memory work is relegated to a minor position, because it is believed that what a child thoroughly comprehends, he will remember without special bolstering of the memory.

Field work.

It is very desirable in this system of study that the field work be done thoroughly and systematically. The object of it is not to have examples given in the field of something which students have read about in books, but to study the forms in the field in such a way that the true conception of relief may be reached. In selecting places for field work, select the simplest forms and study them thoroughly.

It may be the tendency of some of the teachers in attendance at the institutes to go to some of the rugged and highly diversified forms, as cliffs, water-falls, caves, &c. *This should never be done.* Select the simplest hill, the simplest stream, the simplest outcrop of soil and subsoil, avoiding all complications that need special explanation.

The instructor, having selected the place, which will rarely be further than a quarter of a mile from the school building, should prepare thoroughly for the lesson to be given. He should go over the area alone and study it minutely. Go over it first to see how it illustrates the lesson to be given, and then make a map on tablet marking the different places to be noticed and what they are to illustrate. Draw cross sections at certain places showing the structure of the forms studied. This having been done the instructor is ready to formulate a plan for the recitation.

Do not go into the field without knowing definitely where, what and how the lesson is to be in full. Field work is exceedingly interesting, but it is difficult to conduct successfully. The importance of a well formed plan can not be over-estimated. The plan should include the exact place at which the class will reach the area to be studied, the ground over which the lesson goes, and the order of development. The method used should be almost entirely that of questioning. Almost any simple problem of landscape may be solved by observation under skillful direction. The students should keep notes as they pass over the ground. They may be asked to make the same maps, the same observations, and about the same notes that the instructor made in first going over the field.

These points having been made in the field, the whole class should be taken back to the room or the work resumed on the following day, and the concepts made more full and clear from work in the field. Definitions may be framed and put aside for future use. The further room work is explained in the different lessons and consists largely of the use of the constructive imagination based upon facts obtained from observation and from books.

If the instructor prefers it, the room work may be done without the

field work and made to a certain degree, effective; but the field work gives vitality to the whole system. It is hoped that *every* instructor in geography will attempt the field work; the results which follow will show the necessity of thorough preparation.

Materials.

Each teacher should have a ruler and a tablet.

For drawing crayon relief maps black lead crayon is desirable, though thick heavy lead pencils will answer the purpose.

For moulding, paper pulp is used. It is made by crumpling up common newspaper in a bucket, pouring boiling hot water upon it, and stirring it until the paper is dissolved into a pulpy mass.* It is then ready for use. The moulding may then be done according to directions given in lesson 8.

In the lessons on plants and animals, as much illustrative materials as possibly should be gathered and presented to the class. Many facts can be gathered from the Agricultural Reports of the U. S. Government. The central thought in all these lessons is the earth as the Home of Man.

In the study of the main topographic features and also in the study of industries, nothing can be used to better advantage than pictures. They may be gathered from any source, newspapers, magazines, advertisements or anywhere else. They may be pasted on card board, or passed around as they are cut from the paper. They should be carefully selected and used only at the proper time.

References.

Any text-book on geography may be used for whatever it will yield to the subject under consideration. The arrangement of the matter will be found to differ somewhat from the general line of texts, but the matter may be gathered from them and classified as requested.

The following books may be referred to for the purposes named:

Lessons in the New Geography, by Trotter, gives excellent items of information on the lessons concerning climate, plants and animals, races of man, and commerce.

Primary Geography by Frye, has fine *pictures*, well arranged. The stories which are models of clearness and vivacity, contain much valuable information.

A copy of each of these books has been furnished each of the County Commissioners by the publishers, with the understanding that the instructors may have the use of the same in preparing for their classes.

Many other books might be mentioned and commented on, but these are mentioned as especially helpful in the preparation of the lessons suggested in this outline.

THE USE OF THESE LESSONS.

The instructors and teachers should not make the mistake of supposing that the work suggested in this outline, can be thoroughly mastered in four weeks. The outline is made rather full in order that it may be clearly understood. It is expected that in many institutes the work will have to be shortened and much of the material omitted. In order to facilitate this work, certain lessons have been marked optional as is explained later.

This system of geography has been partially set forth in *The Normal Review*, published at Warrensburg, during the past year; and it will probably be continued in the same paper, and the *Missouri School Journal* during the coming year.

LESSON 1.—SURFACE.

NOTE:—The parts of lessons marked "op." are not essential to the understanding of the system and may be omitted if in the judgment of the instructor, the class will not have time to do them satisfactorily.

Field Work.

Go to the school yard and study the surface; its color, texture, moisture, composition and covering. Then study a place where the upper layer has been cut through into the yellow subsoil, as in a street, and notice the two layers with the irregular line of contact between them. After carefully examining the soil and subsoil and comparing them as to color, texture and composition, go to an outcrop which shows the rock under the subsoil and develop the idea that surface consists of soil, subsoil and rock.

Study the structure of the surface soils, as, limestone soil, shale soil, and sandstone soil, and note their formation from rock and vegetable mold. Compare them and note the varying fertility shown. Find the effects of burrowing animals and roots of plants on formation of soil layer. Map the area studied and locate the places studied.

Room Work.

1. If the preceding work has been well done, the work suggested below will be easy and natural; but if the field work has not been done, these points should be discussed in the room.

2. Develop ideas and make definitions of land surface and water surface.

3. Expand the idea of the surface studied into a plain. Expand the idea of road or street into a desert in the same way. Locate the principal deserts of the world. Discuss forests, marshes and prairies, contrasting each by giving examples with which all may be familiar.

4. Discuss the different kinds of soil and the value of each in the production of useful plants.

LESSON 2.—RELIEF.

Field Work.

Select the nearest typical hill, and see that it is not too complex. **A**

satisfactory one can generally be found near the school building. Go to the top of it and note the shape on all sides from the summit. Go up and down the sides, developing the terms of summit, crest, slopes, base or foot. Note disposition of soil, subsoil and rock on the surface. Note any irregularities of slopes, but do not study the streams in a critical way. A map may be made in the field. If the instructors are so inclined, here is the proper place to introduce the process of making contour lines. As the slopes are studied and compared, the class may be lead to estimate the difference in level of different places and to connect the places of the same level by a line, and in this way pass around the hill. In this way the hill may be surrounded several times and the contours placed on the maps. After all the points are developed in the field and located on the map, make a model of the hill according to the directions in lesson 8.

Room Work.

1. Develop idea and definition of hill—make map and model.
 2. By mapping, extend the hill into series of hills, chains of hills and ridges.
 3. Develop in the same way mountain, mountain chain, and mountain system.
 4. Connect mountains with their plains on either side, and give an idea of mountain and plain topography.
 5. Locate the principal mountain ranges of the earth and discuss their structure.
 6. Discuss continental elevation—a big, and more or less flat, mountain base, into which all these forms are carved by running water.
- The abundant use of pictures will be found to help this lesson and make it plainer.

LESSON 3.—THE LIFE ELEMENT IN A PLANT.

1. *Protoplasm*: What is it?
2. *Utility of Plants*: Furnish food for man and other animals. Furnish lumber, fuel and fiber for cloth, ropes, etc.
3. *Action of Plants*: Make mineral matter into organic matter, which can be used as food by animals. Separate carbonic acid gas into carbon and oxygen, thus rendering it suitable for breathing.
4. *Chlorophyll*: Leaf green. This is the active agent in plant life. Works only in sunlight. Very little food, (e. g. mushrooms) comes from plants not green.

5. Other things being as they are, the world would be uninhabitable, were it not for chlorophyll.

6. What is a fertile country? Why is a fertile country more likely to be thickly peopled than a sterile one? What exceptions may there be to this rule? Can countries be too fertile for civilization to thrive in?

LESSON 4.—CEREALS AND GRASSES.

1. *Characteristics of Grasses*: Parallel veined leaves, jointed stems,

single seed leaf.

2. Make a list of all grasses growing in Missouri that you are acquainted with. Is corn a grass? Is sorghum? Is wheat? Is clover?

3. What grasses (grains) are used directly for human food, and what indirectly for pasture and hay?

4. What food crops are not grasses? Relative values of the two kinds of crops, i. e. grasses and not grasses?

5. In Missouri, in 1893, the three principal cereal crops, corn, wheat and oats, amounted to 202 million bushels, and with the hay crop, were valued at 87 million dollars. Potatoes, the principal non-cereal crop, amounted to 7 million bushels, valued at 4 million dollars.

6. Should the value of cattle, horses and hogs be added to the value of the grass crops, in estimating the value of the grasses? Should sugar be added? Tobacco? Cotton? What occupations could not flourish where grasses would not grow?

LESSON 5.

Food Animals.

1. Land animals.

a. Animals of the chase: Make a list of wild animals used for food. Discuss habits, methods of capture, and by whom used for food.

b. Animals of the air: Make a list of wild fowls used for food. Discuss habits, methods of capture and by whom used for food.

c. op. Domestic animals: Hogs, cattle, etc. Make a complete list. Chickens, turkeys, etc. Make a complete list. Discuss methods of care and preparation for the markets, and for food.

2. *Marine Animals.*

a. Make a list of food products derived from the sea, lakes, and rivers.

b. One acre of sea surface is said to be capable of producing more food than an acre of land.

c. How do oysters grow? What is whale bone? Where is salmon canned? What are sardines?

d. What industries do men living near the sea shore naturally follow?

e. op. What is a fish pond? Why has the making of fish ponds increased so much in the last few years?

LESSON 6.—STREAM SYSTEM.

Field Work.

1. Select a simple stream, the one nearest the school room will answer the purpose. The presence of water in the stream is desirable but not necessary. Go to the source of the stream and follow it down

toward its mouth. Observe slopes of the sides of the basin, and note the steepness and irregularity at different places.

2. On reaching the channel of the stream, examine its shape, direction and slope. Note difference between the slope in the channel and the slope above where a definite channel is formed. Trace the slopes of the sides and the slope of the channel back to the ridge or watershed. Follow the watershed with the eye, noting its shape.

3. Returning to the channel, note the irregularity in the direction of the channel and also of the channel slope. Observe the deposition in the bottom of the stream. Note its color, composition and form, often-times level and flat on top. Discuss the method of depositing this material and trace it to its original position if possible. Go on down the stream until a tributary is found running into the main stream. Compare the three slopes of the tributary with the three slopes of the main stream.

4. At the junction of the streams will generally be found a small delta. Study it as the deposit was studied before and discuss the process of its formation. Notice how perfectly the channel of the tributary is adjusted to the main stream, and how perfectly the basin slopes are adjusted to the channel slopes. Discuss now the material brought down by the tributary, how the stream gets it, what it does with it and what is its final destination.

5. Develop also the fact that the water running down the channel slope has not only cut out the channel, but has also cut out all the land between the channel slope and the level of the watershed.

6. Observe the general change in the watershed and slopes as the mouth of the stream is approached, and compare the stream here with the part first studied.

7. When the mouth of the stream is reached or when the stream has been followed as long as is desirable, a summary should be made by estimating distances of channel slope and basin slopes, height to level of watershed, and trying to realize the immense amount of material that has been moved and carried out and the increased amount of vegetable bearing surface resulting therefrom.

8. An accurate map of stream and tributaries should be made according to a definite scale as the work proceeds. A vertical map of channel, and then of the basin may be made. If the teacher desires to use contour lines, they may be made by returning to the source and coming down, noting carefully the differences in level and drawing the contour lines. The stream should be mapped and moulded according to directions given in lesson 8.

NOTE:—Do not try to explain or have explained such difficult phenomena as water falls, rapids, or caves in the stream bed. Such things are

reserved for work in Physical Geography or Geology.

Room Work.

1. Develop definitions of terms used in the above as watershed, valley, channel, slope, basin, delta, tributary, etc.

2. Make map of stream to scale, locating the parts named.

3. op. Expand this map into the map of a river system by changing the scale and enlarging the map. The fact that a river system by means of a net work of water made channels, reaches and controls the surface drainage of almost every square foot of its basin may be discussed. River systems may now be drawn and contoured.

4 op. Discuss the value of a river system and tell why it has always so influenced the history and progress of a country. Discuss canals and compare with rivers.

5. op. Study and locate the principal rivers and river basins of the earth.

LESSON 7—COAST LINE.

1. *Field Work.*

a. This work may be done along the banks of a small lake, or if such is not convenient the banks of a stream will suffice. A pool in the stream will be better than any other position along the stream.

b. Note the water along the bank, the shape of the line of contact.

c. Observe the bank along the line of contact and above it, note the difference in shape between the two places. If the water has at one time been higher than it is now, determine the contour of the water at that time.

d. Make a surface map showing the land on one side, the water on the other, and the irregular line of contact between them. Make also a section or vertical map running from the land under the water, showing the bank, the water surface and the sedimentation at bottom of water on the original bottom of the water.

e. Notice now the water surface. If the body of water is large or if there is a breeze moving, the surface will show constant rippling. From this develop waves, currents, and tides. Note the effect of the waves striking against the surface of the bank, and develop from this the constant destruction of the land along the coast, and the encroachment of the sea.

f. Observe also the sediment as it comes from the coast and the streams; determine what is done with it, and what position it has on the lake bottom.

- g. Develop now the ideas of cape, promontory, peninsula, isthmus, island, and bay, gulf, strait, channel, estuary, lake and sound. Make vertical and horizontal maps of each, that the concepts may be clearer.

2. *Room Work.*

- a. Develop definitions of coast line terms according to the studies in the field.
- b. Make horizontal and vertical map of ocean coast line, by changing scale and showing the difference in steepness of banks at shore.
- c. op. Expend this vertical map across the ocean showing the shape of the bottom of the ocean in profile. It may also be extended over the land at least far enough to show its difference in regularity between the bottom of the sea and the surface of the land.
- d. Discuss the structure of a good harbor, making vertical map to show it. What influences have good harbors on the civilization of a country?
- e. op. Discuss the formation of irregularities in the coast line and of continental islands. In what way does the length of the coast line affect the people in a country?
- f. op. Study and locate on wall map, the ocean currents in northern hemisphere. Why are these more clearly marked than in southern hemisphere?
- g. op. Discuss the deposits in the ocean—those near shore and those farther out. How are these deposits brought to the sea and how are they distributed?
- h. op. Compare the coast lines of Europe and America.

LESSON 8.—MAPPING AND MOULDING.

I. *Mapping.*

- a. Plain mapping to become familiar with scale may be begun in school room, then extended to school yard and town. In mapping the school room, the sides should be mapped thus showing a vertical map or section.
- b. Surface mapping should also always be to scale, and the vertical map or section should generally accompany the horizontal map. When the yard is studied, it may be mapped and also the hill and stream. In addition to the surface mapping, the relief of the hill and stream may be shown by contours if that can be done. In like manner, the coast line may be mapped and its elevation indicated by shading or contours. When the different surface and relief forms have been studied according to lessons 1, 2,

6, and 7; the American continent should be drawn according to some simple system of map drawing. Any system will answer the purpose. The elevation should be represented by contour lines or by crayon relief.

2. op. *Moulding.*

- a. After the hill has been studied in the field and mapped accurately, mould it on a piece of muslin tacked to a board. The model should be made according to the map with a definite vertical and horizontal scale. If contours have been made, they will be found to be of great service, and if they are not used, some means of indicating places on the map that require irregularities in the moulding, should be adopted.
- b. In the same way the stream system and coast line may be moulded if time permits.
- c. Mould continent after it has been mapped and shown in crayon relief. If contours are not used here, it will be necessary to obtain the altitude of any place by comparison of that place with others of known altitude. While accuracy is somewhat difficult to get by this method, a fairly good model may be made by repeated effort. Mould North America, South America, and Europe by this process.

LESSON 9—TRANSPORTATION.

1. Discuss the simplest modes of transportation and the most primitive methods known to the race.

2. Animals as carriers—Beasts of Burden.

- a. Make a list of animals that are used by man as his helpers in your own state.
- b. Make a list of other animals used as beasts of burden in other places.
- c. Where are dogs used as beasts of burden? Camels? Llamas? Reindeer?
- d. Why is not one animal, as the horse, used all over the world for burden bearing purposes?
- e. What is the peculiarity of each animal that adapts him for the purpose in his own country?
- f. Why are oxen less used than formerly?
- g. What industries depend upon the work of animals?
- h. What would be the effect if all beasts of burden were dispensed with, other things being as they are?

3. op. *Vehicles.*

- a. One and two wheeled vehicles, wheel barrow, cart, bicycle, etc.

- b. Four wheeled vehicles, wagon, carriage, etc. The wagon should be studied minutely, and its structure should be discussed as fully as time will permit. Why does America, especially the Mississippi river basin, have the best wagons in the world?
- c. What is the value of good roads?
4. op. Means of transportation on water.
 - a. Discuss the form and structure of canoe, sail boat, sail ship, steam boat and steam ship.
 - b. The sail boat and steam ship should be thoroughly studied. Pictures of steam ships may some times be obtained at the hardware stores, and their structure may be found explained in the dictionaries or encyclopædia.
5. Means of transportation on tracks.
 - a. Study the structure and process of building street car and railroad tracks.
 - b. Study steam engine thoroughly, finding out as much as is possible about its application of steam to wheels.
 - c. Study and compare structure and capacity of street cars, freight cars and passenger cars. Tell how each is adapted to the purpose for which it is used.
 - d. Electric cars—how is the electric car propelled? How does this method compare with that of steam engine? Which do you think is most likely to be used in the future? Why?
6. op. Discuss the uses of these in producing pleasure and profit to man. What effect will each have on the lumber industry? The iron industry? The rubber industry? The coal industry? How will they affect public roads?

LESSON 10—AIR, WINDS AND CLIMATE.

1. Air. Discuss the composition of air and its position with reference to the earth's surface.
2. Impurities in air, as water, dust and disease germs. The method of getting and holding each.
3. Source of heat to air and the principles of its distribution. Evaporation, dew, frost, cloud and rain formation.
4. Winds. Effect of heat on air—expands it producing an upward flow of air in the vicinity of equator. This results in a movement of air toward that place, and a downward rush of air at 30° latitude north and south. This carries with it vapor which condenses or expands with the corresponding movements of the air. Discuss the distribution of vapor on the earth as a result of the distribution of heat.
4. op. The rising column of air in the center of a storm starts a wind from a colder region toward it, and also one from a warmer region.

Discuss the complete change of temperature caused by this whirl around a center. What is it called? The warm side brings rain, the cold side dry weather. What direction does the storm move? What effect does this have on the weather of the United States?

5. op. The heat belt at the equator causing the air to rise, then causes the air in general to go from the equator poleward as upper currents and from the poles to the equator as surface currents. What are constant winds? What are trade winds?

6. Climate. What is climate? How are averages of weather made? What direct influence has the sun on the climate of the earth? How do the land and water surfaces affect climate? How does altitude affect land climate? Discuss effects of winds on climate. How do ocean currents affect climate? Are there really any such things as astronomical climate zones?

7. Discuss the climate of the following places: New York, Chicago, St. Louis and Salt Lake City.

LESSON 11—INDUSTRIES.

1. What is an industry? Name the principal industries of Missouri and of United States.

2. Origin of an industry.

- a. In the natural demand as for food products.
- b. In the needs of the people.
- c. In tastes and desires.
- d. Why do certain industries originate at certain places? Make a list of industries that have been influenced by natural surroundings.

3. Elements in an industry.

- a. Production of materials.
- b. Activity of man in collecting and arranging the materials.
- c. The commerce or furnishing the prepared article by transportation and trade for use of the consumer.

4. op. Principal industries.

- a. Food.
 - (1.) Corn, wheat, rice, coffee, barley, etc.
 - (2.) Hogs, cattle, fowls, fish, etc.
- b. Clothing.
 - (1.) Cotton, hemp, bamboo, flax, etc.
 - (2.) Sheep, silk moth, bear, seal, etc.
- c. Shelter.
 - (1.) Skins of animals used by primitive peoples.
 - (2.) Lumber, brick and stone.
 - (3.) Iron, zinc, glass, etc.
- d. Discuss the above industries, beginning with the natural con-

dition of the materials and following them through the changes in preparation, and finally the transportation and uses. Locate the above mentioned industries in Missouri and in America.

- e. Mining, banking, etc., may next be considered and their bearing on the welfare of man may be discussed.

NOTE:—One or two of the industries mentioned in 4, may be treated exhaustively and taken as types by which the others may be studied. The teachers may then work out the others at their leisure, when they teach the subject. The industries to be selected are left to the discretion of the instructor.

LESSON 12.—FRUITS.

1. Make a list of all fruits growing in Missouri, that you are acquainted with.
2. Make a list of fruits imported into Missouri, and tell where each comes from.
3. Where is the home of the cocoanut? The banana? The nutmeg? The pineapple?
4. What industries depend largely upon fruits? How does fruit raising affect the tin using industries? How does it affect railroad and steamship companies? In what directions do most railroads and steamships that carry fruits run?

LESSON 13.—INJURIOUS ANIMALS AND PLANTS.

1. Make a list of all insects and other animals of Missouri that you know, that injure crops.
2. Total injury done to crops every year by insects in the United States is estimated at 380 millions of dollars.
3. Is it possible for insects to render unprofitable the raising of wheat or corn?
4. Is it possible for insects to render a country uncultivable?
5. Is it possible for insects, e. g., mosquitos, flies, ticks, lice, etc., to render a country uninhabitable?
6. In parts of Australia, rabbits have almost ruined the sheep industry.
7. Twenty thousand people are killed in India every year by venomous serpents and by tigers.
8. A few poisons, such as poison ivy, etc.
9. Bacteria are small, colorless plants. Most of them are beneficial, some are injurious, producing disease. All decay is caused by bacteria.
10. The principal injurious plants are such as corn smut, wheat rust, potato rot, blights, molds and mildews.
11. All these plants are small, growing in the tissues of other plants and living upon their juices. They cause great injury. One-hundred

millions dollars a year is the best estimate of the losses occasioned by these plants in the United States.

12. What would be the effect if such plants should render unprofitable, the growing of wheat and corn.

13. Make a list of the most troublesome weeds. What is a weed? How great an expense is involved to farmers in over coming weeds? How does this affect the price of the crop raised? How does it affect the amount raised? How does it affect the number of people a country can support?

LESSON 14.—ANIMALS AND PLANT ZONES.

1. Make as long a list as you can of the native animals of North America.

2. What native animals are characteristic of South America? Of Africa?

3. Why are some animals found only in limited areas?

4. Why is the polar bear found only in the Arctic regions? Why are elephants found in Africa and not in Europe?

5. Some animals are found all over the world. Why? Why is man found in all countries Is any country uninhabitable

6. What conditions limit the range of animals and plants

7. Animals and plants, rather than mathematical lines, mark zones. What animals and plants are characteristic of each zone?

LESSON 15.—CITIES.

1. Location of cities—determined by convenience.

a. In plant zones. Locate ten cities in plant zones, i. e., cities which owe their existence to that of the plant zone.

b. In good harbors. Locate ten cities that owe their existence solely or principally to the presence of the good harbor.

c. At points of distribution for railroads or for rivers. Locate ten cities which are located at good points of distribution.

2. op. Arrangement of cities.

a. Business portion.

b. Residence portion.

c. Manufacturing portion. What determines the location of each portion, and what are the differences in their arrangement?

d. Study the map of some large city, as Kansas City or St. Louis, and discuss the street system, etc.

3. Advantages of cities.

a. Transportation.

b. Business opportunity.

c. Education.

d. Association—as religion, education and government.

4. op. Some typical cities.
 - a. Chicago, the inland city.
 - b. New York, the commercial city.
 - c. St. Louis, the valley city.
 - d. Kansas City, the gate city. Study the peculiarities of each city and also the peculiarities of the people who inhabit it. This gives the natural characteristics of the people better than they can be obtained in any other way. Does the location and thrift of a great city depend on the will of man?

LESSON 16.—RACES OF MEN.

1. Peculiarities of types (physical and mental.)
 - a. White man—Englishman.
 - b. Yellow man—Chinaman.
 - c. Black man—negro.
 - d. Red man—Indian.
 - e. What makes the difference in color between the different races above referred to?
2. Surroundings and advantages.
 - a. Home life of each in youth and maturity.
 - b. Religion and government.
 - c. Process of maintenance.
 - d. Education—fitting for life.
 - e. Discuss the adaptation of the people to the country in which they are found.
3. Value of each race in the progress of the world.
 - a. What improvements have each made upon the natural agencies given him?
 - b. What does the earth furnish to the trade of the world?
 - c. What will be the future of each?
4. op. Location of the Races.
 - a. Where is the home of each race?
 - b. Does the home in any way indicate the mental and moral condition?
 - c. Where is the most favored part of the earth for progress? Why?

LESSON 17—COMMERCE.

1. Simple trading.
 - a. The beginning of commerce is in the trading of children. Illustrate by discussion of methods and motives of trading among children. Trade among savages never gets above this plane.
 - b. Trading among people when simple exchange is made, as, at

- the market place, for mutual advantage.
- c. Trading where money is used to take the place of an article of real value. As at stores and all ordinary business.
 - d. Trading where money only is used, and no intrinsic value is handled, as banks, etc.
2. Domestic Commerce.
- a. Manufacturing, transportation and trading between different parts of the same nation.
 - b. Production, transportation and trading between different parts of the same nation.
3. Foreign Commerce.
- a. Domestic commerce taken across the boundaries of the country of the producer. A market for the surplus.
 - b. Discuss process of transportation in foreign commerce.
 - c. Restriction on foreign trade, ports of entry, traffic, etc.
4. op. Things affecting commerce.
- a. Dependence upon surface and productions of surface—natural and artificial.
 - b. Dependence on transportation and relief, affecting building of water ways.
 - c. Native activities and advancement of peoples. How does commerce affect peoples?
 - d. Illustrate by examples how these things may entirely change commerce.
5. op. Commerce of different peoples.
- a. White race—materials, transportation and peoples involved.
 - b. Yellow race.
 - c. Black race.
 - d. What divisions of these peoples are noted especially for their commerce?
6. Commerce of Missouri.
- a. Name the chief articles of import in Missouri. Make a list, giving country from which they come.
 - b. Make a list of the articles of export from Missouri, and tell if possible, where they are sent.

LESSON 18—POLITICAL DIVISIONS—HISTORY.

1. Formation of Boundary Lines.
- a. By nature—oceans.
 - b. By war—treaty.
 - c. In peace—treaty.
 - d. By discovery and settlement.
 - e. Make a list of nations, illustrating each of the above methods of boundary formation.

2. Values of boundary lines.
 - a. Independent of boundaries.
 - (1.) Natural resources.
 - (2.) Productions largely.
 - (3.) Cities to a great extent.
 - b. Dependent on boundaries lines.
 - (1.) Development and use of a national language.
 - (2.) Manners and customs of people.
 - (3.) Education and industries.
 - (4.) Government.
 - c. Make list of the different kinds of government in the world, and explain each. How does each affect the progress of the people.
 - d. Smaller political divisions as state, county, etc., made solely for purposes of administering government.
3. The placing of boundary lines and the study of the nations politically, should be done after the relief has been mastered and the cities located and studied. The history of the nation by which the boundary line has been formed, forms parts of this study.

SUPPLEMENTARY TOPICS IN SCHOOL MANAGEMENT.

BY SUPT. W. J. HAWKINS, NEVADA.

1. *The Annual School Meeting.*
1. Time and place.
2. Powers and duties.
 - a. School taxes, levy of.
 - b. Length of term of school.
 - c. Special objects indicated by notice.
2. Duties of directors.
 1. Care of school property.
 2. Employment of teacher.
 3. Branches to be taught.
 4. Rules and regulations.
- Mo. School Law, Secs. 7978, 7979, 7992, 7996.
- II. *Organizing the School:*
 1. Plans for the first day.
 2. The program.
 3. Classification of pupils.
 - a. According to records of previous term.

b. By examination and other reliable information.

Note. The teacher has absolute authority in classifying his pupils, and can put the responsibility of a poor, or unjust classification on no one else.

4. Seating of pupils.

III. *School Tactics.*

1. Preparatory—A rational arrangement of the seats, proper location of the stove, light and ventilation.

2. Orderly and quiet movement of the classes.

3. Few signals, but uniform from day to day. Why few? Why uniform?

4. Good influences of the orderly and quiet recitations. a. On pupils in the class. b. On pupils at study. c. On general character of the school.

5. Plans for calling school and dismissing school.

IV. *A Course of Study for District Schools.*

1. Its objects, advantages and how to use it.

2. In the absence of an established course of study.

The duty of the teacher. a. To prepare a course of study. b. To interest pupils in the course of study. c. To interest the Board of Directors in the course of study and secure their co-operation and support in its use.

3. Difficulties in working to a course of study and how to meet them.

4. Records of the progress and standing of pupils. a. Why should they be kept? b. What should be done with them at close of school?

5. Promotion cards. a. Use to pupils. b. Value to the new teacher.

V. *The Recitation.*

1. The length of the recitation

a. In primary class.

b. In intermediate classes.

c. In high school subjects.

2. Divisions of time.

a. Reviews.

b. Lesson of the day.

c. General information.

Assignment of new lesson.

a. Subjects rather than paper.

b. Definite statement of what is required.

c. Suggestions on how to make the preparation.

4. Objects of the recitation.

a. To gain knowledge.

b. Mental development.

VI. *The Teacher in the Recitation:*

1. To test the work of pupils and ascertain their progress.

2. To guide and direct investigation, arouse enthusiasm, and inspire by his example.

3. To estimate the powers of pupils and determine the help that may be necessary.

4. To cultivate respect for systematic and orderly work.

SCHOOL MANAGEMENT.

BY W. T. CARRINGTON, PRIN. SPRINGFIELD HIGH SCHOOL.

In the following outline an attempt has been made to keep reasonably close to a text book on the subject. It is well for every teacher to have a standard work on School Management. Page is recognized as the best all round manual for young teachers, and we recommend it as a text along with this subject.

1. 1. *The Spirit of the Teacher*.—More than mental power required.
2. The motives of the teacher. Teaching cannot be secondary. Harmful results of a low estimate of the importance and dignity of the work.

3. The responsibility of the teacher. Responsible for what he does and for what he does not do.

4. Physical health of pupils. Over excitement. Over study. Impure air. Wrong temperature. Want of exercise.

- II. 1. *Natural Order in Education*. When begin reading. First lesson in numbers, in language, in geography. The use of the pen. Relation of mental and written arithmetic.

2. Manner of studying. Study to know rather than to recite. Study subject rather than book. Mental discipline rather than knowledge.

3. Moral training. Example stronger than precept. Moral nature cultivated by exercise. Appeal to moral sense. What of religion may be taught?

4. Habits of the teacher—neatness, order, punctuality, courtesy.

- III. 1. *The Teacher's Qualification*. What the law requires—more than text book knowledge. How many good readers in the institute? Poor penmanship disrespectful. Value of mental arithmetic.

2. Course of study for country school. Can you use the Official Course? Discuss report of committee of fifteen.

3. Study of special subjects. Practical value of drawing. How and why teach music? How many teachers study drawing and music?

- IV. 1. *Different Views of the Teacher's Work*. The average teacher's view. Your view. The public's view. Views of parents in your last school.

2. What is education? Is imparting knowledge teaching? Etymology of the word.

3. The teacher is as his ideal of human excellence.

V. 1. *Aptness to teach.* Is it instinct or acquired power? The pouring in process versus the drawing out process.

2. Pupils should master difficulties.

3. Uses of general exercises.

VI. 1. *The difference in Schools.* How much is due to the teacher?

2. Can a teacher get too old in the profession? Does long service make one less sympathetic with child life?

3. The teacher's manner, tone, attitude, animation.

VII. 1. *The Recitation.* Do pupils study for recitation? How not to have poor lessons? Concert recitations. Individuality in the recitation.

2. Incentives. Right and wrong spirit of emulation. Evils of "head marks."

3. The question of prizes. Good results. Evil results.

VIII. 1. *Good School Management.* Maximum of liberty and minimum of repression.

2. How cultivate desire to advance, to be useful, to do right.

3. Self-government in the teacher. Extremes of levity and nervousness to be avoided. The evil of vacillation.

IX. 1. *Means of Securing Good Order.* Frankness and firmness commended. School must be kept busy.

2. Government a mean, not the end. Evil of numerous rules. Mistake of too much government.

3. Can a school be kept too quiet? Proper and improper punishment. Can you govern without fear or force?

X. 1. *In loco parentis.* Explain. Extremists on punishment. Cruel punishments and ridicule.

2. Effect of home training on school discipline. Effect of divisions in community.

3. Discretion of silence as to intentions. Don't threaten.

XI. 1. *Corporal Punishment.* When and how administered.

2. Expulsion and its results. What is the law on the subject?

3. Explain a good system of credits.

XII. 1. *Plan of Work.* Daily program. How open school. Time of recess.

2. How get ready for first day. Visiting parents.

3. Getting ready for examination. How often examine school? What the nature and purpose of examination?

XIII. 1. *Relation of Teacher and Parent.* Encourage parents to visit school. Reports of conduct and progress of pupil to parent. Outlook work of the teacher.

2. Personal habits of teacher. Care of health. Proper exercise.

Early rising and regular meals.

3. Self improvement of teacher. Duty to the profession. Means of professional improvement, institutes, association, School Journals.

XIV. 1. *How Teachers May Aid One Another.* Visitation of other schools.

2. Contributing to the press.

3. Advantages of institutes, social and professional.

XV. 1. *Mutual Duties of Parents and Teachers.* Parents must appreciate the importance of school. Teachers must not set up false standards.

2. Some parents are suspicious, some dictatorial. How meet these?

3. Both should be quick to acknowledge a fault and to forgive.

XVI. 1. *Things to Avoid.* Guard against prejudice.

2. Don't attempt to teach too much and attend strictly to school duties during school hours.

3. Don't make excuses and don't ride "hobbies." Give others.

XVII. 1. *Things to be Done.* Convince the pupils that you are their friend. Keep school house neat and in order.

2. Be accurate. Study to make apt illustrations.

3. Never forget a promise. Take every opportunity to point a moral. Give others.

XVIII. *Legal Status of the Teacher.*

1. License. Necessity of it. How secured.

2. Contract. When and how made. What should be in it.

3. Wages. When paid. How recovered when withheld. When can be legally withheld.

4. When can teacher be dismissed? When certificate revoked?

5. When can teacher make rules and regulations?

6. Give law respecting *corporal punishment*.

ELEMENTAL PSYCHOLOGY.

By JNO. T. BUCHANAN, PRIN. K. C. HIGH SCHOOL.

I. Distinguish between mind and body. Show that mind affects body and body influences mind. Outline the nervous system. Discuss it from the outline, and show the function of the nerves and importance of a knowledge of the nervous system in its relation to psychology.

II. The Brain and Its Functions. Describe, locate, and give the function of: a. The Medulla Oblongata; b. The Pons; c. The Cerebellum; d. The Cerebrum. Make a side view of a human brain and trace the

lobes. Discuss the relative positions of the white and gray matter and also the function of each. Show that the wealth of brain surface, as made possible by the development in size, number and depth of cerebral convolutions, is the most characteristic feature of the human brain. Show that the center of hearing lies in the temporal lobes, the visual center, in the occipital lobes. Locate the taste and smell centers. Locate the motor centers.

III. *Sensation.* Define sensation. Show that all our knowledge of the material world comes to the mind *via* the end organs of sense, the different nerves and the brain centers. Discuss the sensations: a. Organic—muscular, nervous, circulatory, nutritive, respiratory, digestive, and those of temperature; b. Taste—sweet, bitter, saline, etc.; c. Smell—fresh, close, pungent, fragrant, etc.; d. Touch—softness, hardness, etc.; e. Hearing—timbre, volume, intensity, pitch, etc.; f. Sight—color, lustre, extension, situation, etc.

IV. Show that the intuitive or perceptive faculties are predominant in childhood. Show the value of careful training of all the senses. Show that clear perception is secured through isolation of subject, vivid impression, rapid transition, and by arousing a many-sided interest. The ready helps are objects, pictures, drawing, modeling, oral description, music, written description. Show that the child should be taught chiefly through the senses. Show the value of arousing the curiosity and of satisfying it.

V. *Attention.*—Its definition. Discuss how personal interest, novelty, enthusiasm and curiosity affect attention. Discuss the uses of forms and slate exercises, diagrams, and other devices for presenting to the eyes the facts to be learned. Discuss the results of divided attention, i. e., of having too many objects before the mind or in immediate succession. Show the result upon the attention of making the illustration more prominent than the principle illustrated.

Show that every sensation of which we are self-conscious depends upon attention. How does an act of attention contribute to mental growth: a. In the realm of intellect; b. Of sensibility; c. Of will? Show that the chief function of education is to direct the attention and to see that it sustains itself when vital facts are brought up for consideration. Discuss the question, "How to secure attention."

VI. *Association of Ideas.*—What is meant by association of ideas? Discuss its so-called laws, that is, contrast, contiguity, resemblance, etc. Show that the association or connection is not between ideas, but between things. Discuss the principle, "The mind tends to act again in the manner in which it has acted before." Show that this is a cerebral, rather than a psychical law. Pronounce a word to your class and have them write the first ten words that are suggested by it. Discuss the as-

sociation of ideas from these lists of words made by your class. How can the principles of the association of ideas be applied in your teaching?

VII. *Memory*.—Define it. Discuss its steps: a. Retention; b. Reproduction; c. Recognition. Show the relation that exists between memory and association of ideas. Show that memory is not a general faculty. Discuss the proposition: "There are as many memories as there are kinds of sensation experiences." Give examples of prodigious memory power. Show that there is an intimate connection between bodily conditions and the phenomena of memory. Discuss memory of the aged, and why memory seldom goes back beyond the third year of childhood. Discuss whether absolute forgetfulness is possible. Discuss the several forms of amnesia.

VIII. *Memory Continued*.—Discuss methods of securing retention: a. Distinct conceptions; b. Value of comparisons; c. Discovery of logical relations; d. Frequent repetitions; e. Writing; f. Artificial helps; g. Correct methods of study; h. Figures of speech and the laws governing their use; i. Arousing the feelings and thus creating an intense interest. Discuss the effect on memory of reproducing in recitation or written review the lesson learned. Distinguish between "cramping" and intelligent memorizing.

IX. *Imagination*. Define it. Distinguish between it and memory. Distinguish between reproductive and constructive imagination. Discuss in order the four types of reproductive imagination: a. The tactile type; b. The visual type; c. The auditory type; d. The motor type. Discuss the three forms of creative imagination: a. The intellectual; b. The practical; c. The artistic or poetic. Discuss the importance of the right use of the imagination. Discuss methods of developing it. What studies are best adapted to fostering it?

X. *The Understanding*. Define conception and concept. Discuss the steps that make up conception, i.e.: a. Presentation; b. Comparison; c. Abstraction; d. Generalization; e. Denomination. Define judgment. Make a classification of the judgments. Give methods of cultivating the judgments. Show how concepts or universals are formed. Define reasoning. Distinguish between inductive and deductive reasoning. Discuss the syllogism. Make syllogisms. What are fallacies? Name the common fallacies used in argument. What studies best exercise the pupil's reasoning power? Show that language is the instrument of reasoning, and that fallacies are often due to the use of ambiguous words. Distinguish between concept and percept, also between synthesis and analysis.

XI. Review the first ten lessons.

XII. *Sensibilities*. Define sensibility. Distinguish between sensations and sentiments. In sensation, distinguish between simple sen-

tience and appetite. Discuss the natural appetites: a. Hunger; b. Thirst; c. Suffocation; d. Weariness; e. Restlessness. Distinguish between emotion, desire and affection. Show that ideal presence is a condition of emotion. Discuss: a. Egoistic emotion; b. Aesthetic emotion; c. Ethical emotion; d. Religious emotion. Discuss the influence of the emotional mood of the teacher on learner, also the influence of the environment. Discuss personal and social desires. Discuss the inspiration and influence of the affections. What motives incite to study? What to good, and what to bad behavior? Show how the sensibilities are affected by temperament, by home influences, by books read, and by treatment in school.

XIII. *Will.* Distinguish between voluntary and involuntary actions. Define instinct. Show that no natural instinct requires to be destroyed. Discuss hypnotism and somnambulism. Show that in the early stages of education the first duty of a teacher is that of a drill-master. Define solicitation. Discuss motors and motives, and show that a motive can exist only in conscious intelligence, and that it derives its value from its relation to feeling. Analyze a voluntary act, bringing out clearly the relation of motive, choice and volition. Discuss the proposition that a strong will is essential to any high attainment. How may the will of a child be directed and properly strengthened?

XIV. *Will.* Continued. Why is it that what is near in time and place influences us more than what is remote? Show the influence of the will in selecting subjects for thought, in holding and directing the attention, in restraining the emotions, and in cherishing or repressing moral convictions. Define habit. Discuss the laws of habit: a. Habit diminishes feeling and increases activity; b. Habit tends to become permanent and to exclude the formation of other habits. Show that correct habits are a tower of strength. Show that bad habits are a power for evil, and should be broken as soon as their effects are known. Discuss the importance of forming correct habits, both physical and mental. How shall the teacher aid the student in forming correct habits? How, in overcoming wrong ones?

XV. *Moral Conviction.* Fix clearly the origin and nature of conscience. Show how general notions of right are built up. Show the difference between an intelligent moral conviction and prejudice. Discuss the proposition: "Clearness and strength of moral convictions depend upon mental peculiarities and education." Discuss methods of teaching correct morals—truth, honesty, respect for parents, regard for lawful authority, etc.

XVI. *Self-Control.* Show that it is a result of self-knowledge. Show that it is essential to proper self-respect. Show that it is essential to the proper direction of others. Show that it is especially essential in the

teacher in regard to: a. Personal habits and deportment. b. Temper, utterance, expression of countenance, etc. Discuss the following aids to self-control in the school room: a. Knowledge of what is to be taught and how to present each point; b. Personal interest in the school as a whole and in each pupil; c. Clear moral convictions on all questions of right between teacher and pupil. Discuss the proposition: "Self-knowledge is the essence of all knowledge, and he that ruleth his spirit is better than he that taketh a city." Discuss methods for promoting self-control in pupils.

XVII. *Education.* Define it. Freedom in the use of all the faculties, the end to be attained. Discuss the various educational forces which affect the problem: a. The teacher's specific sphere; b. The material at his command; c. The limit of the child's capacity; d. The work which the child must do for himself. The method of the teacher must be adapted to the stage of the child: in the perceptive stage, illustration; in the imaginative, combination and elaboration; in the reasoning, demonstration. Discuss and interpret the following so-called laws: Education must proceed: a. From the known to the unknown; b. From the simple to the complex; c. From the part to the whole; d. From the idea to the symbol; e. From the concrete to the abstract; f. From the effect to the cause; g. From individuals to generals; h. From facts to principles; i. From imitation to origination; j. From acceptance of authority to independent reasoning.

XVIII. Build up a general outline of the mental faculties from the work already accomplished and fix clearly the definitions of the terms used. Compare the classifications by various authors, and discuss the value of psychology to the teacher.

NOTE:—Krohn's Psychology will be found specially helpful in Lessons I–IX; Hill, in Lessons X–XVII.

ARITHMETIC.

BY PRIN. G. B. LONGAN, KANSAS CITY.

PRIMARY WORK.

LESSON I.

It will be necessary for the instructor to provide himself with suitable materials for teaching the work outlined under this head. All the measures used in linear, dry and liquid measurement, avoirdupois scales, square inch tablets, and cubic inch blocks are indispensable. Corn, beans, salt, water, and other convenient and cheap materials will greatly facili-

tate the work. It is believed that it is neither necessary nor desirable to exhaust nature in finding objects with which to teach number, nor yet is it any more reasonable to resort to mere devices and arbitrary symbols for the purpose of teaching number, when there are real things, of which children ought to have accurate knowledge, that will serve the same end. This affords the opportunity of teaching in a natural way all that is most important in fractions and denominate numbers. Hence it is urged that linear, liquid and dry measure, avoirdupois weights, square and solid measure, be made the basis of instruction in primary number work, reaching into the third school year. The first three of these are enough for the first year. They should be continued in the second year, and the last three introduced in the order in which they are mentioned. This plan should be continued until No. 100 is reached.

More objective work is necessary in the first year than in the second; and more in the second, than in the third. Objective teaching should give way to the merely concrete; and the concrete, in a degree, to the abstract as rapidly as is consistent with thorough work. It is believed that the formal study of tables and the mere committing of results to memory are not based on sound pedagogical principles.

LESSON II.

The following actual lesson on the number 8 taken in short hand as recited by the children is intended to be suggestive in the treatment of number, and should be discussed from the pedagogical standpoint by the institute. Conditions will vary, and much will depend on the ability of the teacher.

Teacher: Place eight one foot rulers on the table. Pupil does so.

T: Class, count them. Pupil: One, two, three, four, five, six, seven, eight.

T: Form squares with the rulers. Pupil does so.

T: How many squares did you make with eight rulers? P: I made two squares.

T: How many does it take to make one square? P: It takes four rulers to make one square.

T: Four rulers and four rulers make how many rulers? P: Four rulers and four rulers are eight rulers.

T: Two times four rulers are how many rulers? P: Two times four rulers are eight rulers.

T: What two numbers added together make eight? P: Four and four make eight.

T: Form triangles with rulers. Pupil does so. P: I made two triangles with eight rulers, and had two rulers left.

T: How many rulers did you use in making one triangle? P: I used three rulers in making one triangle.

T: What three numbers added together make eight? P: Three and three and two make eight.

T: In eight how many threes? P: In eight there are two and two-thirds threes.

T: You may form crosses with the rulers. Pupil does so. P: With eight rulers I have made four crosses.

T: How many rulers did you use in making one cross? P: I used two rulers in making one cross.

T: Two rulers and two rulers and two rulers and two rulers are how many rulers? P: Two rulers and two rulers and two rulers and two rulers are eight rulers.

T: Four times two rulers are how many rulers? P: Four times two rulers are eight rulers.

T: In eight there are how many twos? P: In eight there are four twos.

T: You may place the rulers so as to form a straight line on the table. Pupil does so.

T: How long is that line? P: That line is eight feet long.

T: You may separate this line into two equal parts. Pupil does so.

T: How long is each part? Each part is four feet long.

T: What is one half of eight feet? P: One-half of eight feet is four feet.

T: You may divide the line into four equal parts. Pupil does so.

T: How long is each part? P: Each part is two feet long.

T: What is one-fourth of eight feet? P: One-fourth of eight feet is two feet.

T: Come to the table and show three-fourths of eight feet. Pupil does so.

T: Three-fourths of eight feet are how many feet? P: Three-fourths of eight feet are six feet.

T: You may come and divide the line in eight equal parts. Pupil does so. P: I have divided the line into eight equal parts.

T: How long is each part? P: Each part is one foot long.

T: What is one-eighth of eight feet? P: One-eighth of eight feet is one foot.

Teacher places the rulers in a straight line.

T: You may separate the line to show how many yards in eight feet. Pupil does so. P: In eight feet there are two and two-thirds yards.

T: In seven feet there are how many yards? P: In seven feet there are two and one-third yards.

T: In six feet there are how many yards? P: In six feet there are two yards.

T: In five feet there are how many yards? P: In five feet there are one and two-thirds yards.

T: In four feet there are how many yards? P: In four feet there are one and one-third yards.

T: In three feet there are how many yards? P: In three feet there is one yard.

T: In two feet there are how many yards? P: In two feet there are two-thirds of a yard.

T: In one foot there are how many yards? P: In one foot there is one-third of a yard.

T: In two and two-thirds yards there are how many feet? P: In two and two-thirds yards there are eight feet.

T: In one and two-thirds yards there are how many feet? P: In one and two thirds yards there are five feet.

T: In two yards there are how many feet? P: In two yards there are six feet.

T: In one and one-third yards there are how many feet? P: In one and one third yards there are four feet.

T: In two-thirds of a yard there are how many feet? P: In two-thirds of a yard there are two feet.

T: In one-third of a yard there are how many feet? P: In one-third of a yard there is one foot.

LESSON III.

Teach analytically and synthetically, using the gallon as a unit and the half-gallon as a fractional part, show how many halves in one. Teach in like manner how many thirds in one, using the yard as a unit and the foot as a fractional part.

Teach how many fourths in one, using the gallon as the unit and the quart as a fractional part.

Teach how many eighths make one, using the gallon as the unit and the pint as the fractional part.

If necessary to do so, any convenient object may be used to illustrate the fact that five-fifths or six-sixths make one. But most children will perceive this from the instruction above.

The week as a unit and the day as a fraction may be used to teach sevenths; the dime, to teach tenths; the foot, to teach twelfths.

This is further than children should be advanced during the first year. The denominator in fraction work should always be considerably less than the integer that marks the limit of the pupil's advancement.

LESSON IV.

T: You may place eight measures, all of the same size, on the table. Pupil places eight pint measures on the table.

T: Fill them with water. Pupils fill them with water. P: I have

eight pints of water on the table.

T: Find the measure that you think will hold eight pints of water.

P: I think this measure will hold eight pints of water.

T: You may see whether you can put eight pints of water into the measure. Pupil does so. P: I can put just eight pints of water into this measure.

T: How many pints of water will fill a gallon measure? P: Eight pints of water will fill a gallon measure.

T: You may find one-eighth of that gallon of water. Pupil fills one pint measure with water from the gallon measure. P: This is one pint and it is one-eighth of a gallon of water.

T: How do you know it is one-eighth of one gallon of water? P: Because there are eight pints of water in a gallon.

T: Find two-eighths of a gallon of water. Pupil fills another pint measure. P: Two pints of water are two-eighths of a gallon of water.

T: You may find three-eighths of a gallon of water. Pupil fills another pint measure. Three pints are three-eighths of a gallon of water.

T: You may find four-eighths of a gallon of water. Pupil fills another pint measure. P: Four pints are four-eighths of a gallon of water.

T: You may find five-eighths of a gallon of water. Pupil fills another pint measure. P: Five pints are five-eighths of a gallon of water.

T: You may find six-eighths of a gallon of water. Pupil fills another pint measure. P: Six pints are six-eighths of a gallon of water.

T: You may find seven-eighths of a gallon of water. Pupil fills another pint measure. P: Seven pints are seven-eighths of a gallon of water.

T: Find eight-eighths of a gallon of water. Pupil fills the last pint measure with water. P: Eight pints are eight-eighths of a gallon of water.

T: Separate the measures of water to show the two halves of a gallon of water. Pupil does so, placing four pints in each group.

T: Tell me again how much of a gallon of water a pint of water is. P: A pint of water is one-eighth of a gallon of water.

T: How many one-eighths of a gallon then, in one-half a gallon of water? P: There are four one-eighths of a gallon of water in one-half a gallon of water.

T: Separate the measures of water to show the four-fourths of a gallon of water. Pupil does so, placing two pints in each group.

T: How many fourths of a gallon of water in one-half a gallon of water? P: There are two one-fourths of a gallon of water in one-half of a gallon of water.

T: How many one-eighths in one-half a gallon of water? P: There are four one-eighths in one half a gallon of water.

T: Show four-eighths of a gallon of water. Pupil counts out: one, two, three, four pints of water.

T: Show three-fourths of a gallon of water. Pupil shows two pint measures,—one fourth; four pint measures,—two fourths; six pint measures,—three fourths of a gallon of water.

T: Show how many one-fourths in three-fourths of a gallon of water. P: In three-fourths of a gallon of water there are three one fourths of a gallon.

T: How many one-eighths in three-fourths of a gallon of water. P: (points to six measures.) There are six one-eighths in three-fourths of a gallon of water.

T: In eight pints there are how many gallons? P: In eight pints there is one gallon.

T: In seven pints there are how many gallons? P: In seven pints there are seven-eighths of a gallon of water.

T: In six pints there are how many gallons? P: In six pints there are six-eighths of a gallon of water.

T: In five pints there are how many gallons? P: In five pints there are five-eighths of a gallon of water.

T: In four pints there are how many gallons? P: In four pints there are four-eighths of a gallon of water.

T: In three pints there are how many gallons of water? P: In three pints there are three-eighths of a gallon of water.

T: In two pints there are how many gallons of water? P: In two pints there are two-eighths of a gallon of water.

T: In one pint there are how many gallons of water? P: In one pint there is one-eighth of a gallon of water.

T: One-fourth of a gallon and one-eighth of a gallon are what part of a gallon? P: One-fourth of a gallon and one-eighth of a gallon are three-eighths of a gallon.

T: Three-eighths of a gallon and one-eighth of a gallon are what part of a gallon? P: Three-eighths of a gallon and one-eighth of a gallon are one-half of a gallon.

T: One-half of a gallon and one-eighth of a gallon are what part of a gallon? P: One-half of a gallon and one-eighth of a gallon are five-eighths of a gallon.

T: One-half of a gallon and one-fourth of a gallon are what part of a gallon? P: One-half of a gallon and one-fourth of a gallon are three-fourths of a gallon, or three-fourths of a gallon.

T: Five-eighths of a gallon and one-fourth of a gallon are what part of a gallon? P: Five-eighths of a gallon and one-fourth of a gallon are

seven-eighths of a gallon.

T: Three-fourths of a gallon and one-eighth of a gallon are what part of a gallon? P: Three-fourths of a gallon and one-eighth of a gallon are seven-eighths of a gallon.

T: Seven-eighths of a gallon and one-eighth of a gallon are what part of a gallon? P: Seven-eighths of a gallon and one-eighth of a gallon are one gallon.

T: In eight-eighths of a gallon there are how many gallons? P: In eight-eighths of a gallon there is one gallon.

T: In eight-eighths of a gallon of water, there are how many one-fourths? P: In eight-eighths of a gallon of water there are four one-fourths of a gallon.

T: In six-eighths of a gallon of water there are how many one-fourths of a gallon of water? P: In six-eighths of a gallon of water there are three one-fourths of a gallon of water.

T: In one-half gallon of water there are how many one-fourths of a gallon? P: In one-half gallon of water there are two one-fourths.

T: In one-half gallon of water there are how many one-eighths of a gallon? P: In one-half gallon of water there are four one-eighths of a gallon of water.

T: One-eighth of a gallon of water taken from one-half of a gallon of water leaves what? P: One-eighth of a gallon of water taken from one-half of a gallon of water leaves three eighths of a gallon of water.

T: One fourth of a gallon of water taken from one-half of a gallon of water leaves what? P: One fourth of a gallon of water taken from one-half of a gallon of water leaves one-fourth of a gallon of water.

T: One-eighth of a gallon of water taken from one-fourth of a gallon of water leaves what? P: One eighth of a gallon of water taken from one-fourth of a gallon of water leaves one-eighth of a gallon of water.

T: One-fourth of a gallon of water taken from five-eighths of a gallon of water leaves what? P: One fourth of a gallon of water taken from five-eighths of a gallon of water leaves three-eighths of a gallon of water.

T: One-fourth of a gallon of water taken from seven-eighths of a gallon of water leaves what? P: One-fourth of a gallon of water taken from seven-eighths of a gallon of water leaves five-eighths of a gallon of water.

LESSON V.

T: What unit will you use to show what two-thirds and one-sixth are? P: I will use the foot.

T: State the problem. P: Two-thirds of a foot and one-sixth of a foot equal what?

T: Explain. P: Two-thirds of a foot are eight inches; one-sixth of a foot is two inches. One inch is one-twelfth of a foot; eight inches are eight-twelfths of a foot; two inches are two-twelfths of a foot. Eight twelfths of a foot and two-twelfths of a foot are ten-twelfths of a foot, or five-sixths of a foot.

The instructor should study this explanation very carefully; and, using different units for objective illustration,—as the dime, the pound, the gallon, the yard and the square yard,—teach all the fundamental processes, adapting the fraction to the unit.

In teaching the number 32, linear measure, square measure, cubic measure and avoirdupois weights may be used for objective illustration.

Using linear measure, objects may be measured and lines drawn, always beginning with the shorter length, in order to build upon what the children already know.

The rectangle furnishes an excellent basis for teaching grouping and parts of the number. Measuring different rectangular shapes, drawing rectangles containing 32 square inches, and then decreasing the number of square inches by erasing these,—will be found useful in teaching both grouping and combination.

Cubic measure may be utilized by building from 32 blocks, each one a cubic inch, solids of all possible dimensions.

Quantities may be weighed, two pounds being the limit, gradually approached, in order to show the relation between the number 32 and the numbers before studied.

LESSON VI.

The work of the third year, at least for a part of it, should be along the line already outlined for the first and second years.

The subject of percentage may now be introduced. Some such beginning as this will be found effective:

Children, you have learned that in a bushel there are two halves of a bushel, that a gallon has four-fourths in it, that a foot is three-thirds of itself. Now I want to tell you something you have not heard of before. It is this. A bushel is one hundred per cent of itself. A gallon has one hundred per cent of a gallon in it. It takes one hundred per cent of a foot to make a foot. What per cent of a yard makes a yard? A pound is what per cent of itself? If it takes a hundred per cent of a bushel to make a bushel a half bushel is what per cent of a bushel? A half gallon is what per cent of a gallon? Six inches are what per cent of a foot? Eight ounces are what per cent of a pound? What is fifty per cent of a quart? What is fifty per cent of a yard? Fifty per cent of a square yard? What per cent is a quart of a gallon? What per cent is a pint of a quart? What per cent is a foot of a yard? What per cent are four

inches of a foot? What is twenty-five per cent of a foot? What is twelve and a half per cent of a gallon? What is twenty-five per cent of a dime?

Discuss the advantages of teaching percentage in the third year?

LESSON VII.

INTERMEDIATE WORK.

What is a prime number?

When are numbers relatively prime?

What may such numbers be?

What are factors?

When the result of two factors and one of them are known, how find the other? Illustrate.

Show how this principle is used in proportion, in square root.

When the result of three factors and two of them are known, how find the other? Illustrate.

Show how this principle is involved in cube root.

What is a multiple? A common multiple? A least common multiple?

What is a divisor? A common divisor? A greatest common divisor?

Review and illustrate the principles of fractions.

LESSON VIII.

Show the points of similarity and the points of difference in the following: \$1327568; \$. 1327568.

Develop the principles and rules for pointing decimals in addition, subtraction, multiplication and division.

LESSON IX.

ADVANCED WORK.

1. Pupils should solve problems, not by rule, but by principle.
2. The verbal explanation or analysis of a problem should conform to the solution.
3. The method of solving should be that which finds the clearest, strongest and most accurate expression of the arithmetical facts.
4. A rule should be formulated after a subject has been taught, simply as a summing up in the clearest and briefest way what has been learned.
5. Note 4 applies also to the definition.
6. In accordance with the suggestions above, let the instructor direct his class so that the following rules will be deduced:
To find the percentage—Multiply one per cent of the base by the rate.

To find the rate—Divide the percentage by one per cent of the base.

To find the base—Divide the percentage by the rate, and multiply the quotient by 100.

1. A merchant having \$1650 spent thirteen and a third % of it for coffee at \$.16 a pound. How many pounds did he buy?

2. Having \$720 in bank, I drew out \$468. What % remained in bank?

3. B. lost \$5. which was fourteen and two-sevenths % of his money. How much had he left?

4. Prove the 3rd.

5. A farmer owning 180 acres of land sold a part of it for \$3000 at \$62.50 an acre. What per cent of the land did he sell?

LESSON X.

Such expressions as "the cost is 100%" should not be permitted. They are meaningless. A single word added to the expression above will make it definite and intelligible. This is a common mistake.

1. Sold a horse for \$120, thereby realizing a profit of seventeen and a half percent. Find the cost.

2. Owning seventeen and a half % of a steamboat, I sold 56% of my share for \$6664. Find the value of the boat, the percent left and what it was worth.

3. If I pay three and an eighth cents a pound for sugar, and gain two-fifths %, what is my profit on one pound?

4. Sold two houses for \$2250 each, gaining 12% on one and losing 12% on the other. What did I gain or lose by the transaction?

5. A box of apples containing 200 and costing \$3 were retailed at four for a dime. What was the gain percent?

LESSON XI.

An agent's commission is computed on the amount of business transacted. The amount of business transacted if the agent *buys* is what he *pays* for the property; and if he *sells* is what he receives for it. These points should be thoroughly impressed.

1. An auctioneer sold goods on a commission of four and a half %, and sent the owner \$5118.80. What was his commission?

2. An agent sold a house for \$2450 at one and one-half % commission? What sum did he send the owner?

3. An agent's commission for selling 9240 dollars worth of cotton was \$231. What was the rate of the commission?

4. My agent sold a lot of tobacco on a commission of two and a half per cent. He invested the net proceeds in wheat at \$1.30 cents a bushel, after keeping his commission of 2% for buying. If his whole commission was \$90, how many bushels did he buy?

5. A principal receives from his agent \$1,560, net proceeds of a sale in which the agent's commission was \$40. Find the rate of the commission.

LESSON XII.

A stockbroker's commission is an exception to the rule that the agent's commission is computed on what he *receives or pays* for property. It is a per cent of the par value of the stock or bonds bought or sold.

1. Bought 92 shares K. C. R. R. stock at two and three-fourths % discount, and sold it at three and five-eighths % premium. Find my gain.

2. Bought stock at one and five-eighths % discount, and sold it at two and three-fourths % premium, gaining \$437.50. What was the face value?

3. How many shares of stock bought at 102 and seven-eighths and sold at 98 and three-fourths, brokerage one-half % on each transaction, will cause a loss of \$820?

5. If I invest \$7503.75 in United States Fives at 103, brokerage one-half %, what income will I receive?

5. Which is better, and by what per cent, to buy 9 % stock at 125 or six % stock at 75?

6. At what discount should seven % bonds be bought, to make eight % on the investment?

LESSON XIII.

In interest the following rule is recommended, not to work *by*, but to work *to*. Find the interest for one month, multiply this interest by the time expressed in months, and tenths of a month.

Practice will enable one to make such modifications of the rule as are desirable to secure brevity.

1. What is the interest of \$724.78 for 2 years, 5 months, 19 days at 6%?

2. What is the rate of interest, if \$6.40 gains \$0.56 from August 12 to October 18?

3. I deposited \$540 in the bank, receiving 4% simple interest, until it amounted to \$700. How long did it remain?

4. A man owns stock in a manufactory, which pays annually 9%. He receives quarterly \$324. What sum has he invested?

5. What is the *exact* interest of a \$1000 bond from November 1, 1881, to March 1, 1883, at 4 and $\frac{1}{2}$ %?

LESSON XIV.

1. What is the compound interest of \$300 for four years, eight months and twelve days, at 8%? (Interest compounding semi-annually.)

2. Write in due form a compound interest note.

3. Write in due form an annual interest note.

4. What are interest intervals?

5. What was due July 1, 1881, on a note dated July 1, 1878, for \$1000, with 6% annual interest, and on which was paid December 1, 1879, \$400.

LESSON XV.

1. Paid \$54 for insuring a dwelling worth \$3750, at one and 4-5%? What part of the value was insured?

2. A factory is worth \$3200 and the machinery, \$3760. The factory is insured for four-fifths of its value, at 1%. The policy cost \$1.25. What was the entire bill?

3. A district tax is \$8761.50. B.'s property is assessed at \$1560, and he pays \$42.12 tax. What is the valuation?

4. A certain city requires for next year \$73696 to meet the expense of its public schools. Allowing 2% for collecting and 6% to the uncollectable, find the amount that must be assessed for school purposes.

5. Sold a piece of property at loss of 15%. Had it cost me \$600 less, I should have gained 15%. How much did I pay for the property?

LESSON XVI.

A bank always discounts the sum due at maturity. This is either the face or the amount of the note, as it is not or is an interest-bearing note. The term of discount consists of the exact number of days between the date of discount and the date of maturity. From whom does the bank receive its pay, and when? Of whom does the bank buy the note? What is trade discount? Commercial or business discount? True discount?

1. A note of \$620, dated August 14, 1893, and payable in 90 days, was discounted at a bank September 14, 1893, at 7%. When does this note mature? What does the bank pay for it? What would the bank have paid for it, if it had been payable with interest at 6%.

2. For what sum must a note dated March 9, on four months, be drawn so that if discounted at 5%, May 9—it shall yield \$1090.90? If the note were drawing interest at 6%, what would be the face of the note, if the proceeds are the same?

3. Mr. Brown bought a bill of goods amounting to \$500, on two months' credit. Being offered 5% off for cash, he borrowed the money at a bank which discounted his note at 6%. How much did he save?

4. I sell property for \$10,000 cash or for \$5,000 due in six months and \$6,000 due in one year. Which should I prefer, money being worth to me 6%?

5. What is the difference between a 20% discount; and a discount of 10%, 5% and 5%?

LESSON XVII.

1. Discuss the principles of ratio.

2. Discuss the formation of proportions—simple and compound.
3. Discuss the principles of proportion.
4. If a locomotive can run $66\frac{2}{3}$ miles with $47\frac{1}{2}$ bushels of coal, how far could it run with 68 and 2-5 bushels?
5. If the wages of 48 men for 15 days of 9 hours be \$1296, what would be the wages of twenty-five men for 13 days of eight hours each?

LESSON XVIII.

1. Show the best method for the extraction of square and cube root.
2. Discuss the relation of the square of the hypotenuse of a right-angled triangle to the squares of the other two sides.
3. What are the dimensions of a rectangle whose length is four times its width, if its diagonal is 25 feet?
4. A rectangular solid is square at the ends, and its length is three times its width. If the entire area of the surface is 31 and $5\text{-}10$ square feet, what are its solid contents and its dimensions?
5. Discuss the relation of a solid to a similar one.

XIX.

1. Show the relation of the circumference of a circle to its diameter.
2. What is the relation of the area of a circle to a square whose side is the diameter of the circle?
3. Show the relation of a cylinder to a rectangular solid, diameter and width the same, and length the same.
4. Show the relation of a cone or pyramid to a cylinder just large enough to cut down to the cone-shape.
5. Show the relation of a sphere to a cube whose diameter and edge are equal.
6. Show what similar surfaces and similar solids are.
7. What is the shortest way of finding the relation of similar surfaces? Of similar solids?

PENMANSHIP.

BY STATE SUPT. JOHN R. KIRK.

1. *Writing on Slates.*

The preceding page represents three ways of ruling slates. In the first sample there are four spaces between two successive base lines. This is now the most common method of slate ruling. In the second sample there are five spaces between two successive base lines, the first ruled line below each base line being omitted.

The third is for vertical writing in which the letters are separated into practically two classes: the one space letters, and the two space letters.

All base lines extend entirely across the slate. On each side of the slate a line is drawn from top to bottom nearly one-half inch from the wooden frame of the slate.

Slates should be ruled on one side for all children below the fourth reader class, possibly for that class also. The ruling of slates should be attended to during the first week of the school year. There is no excuse for losing time by working on unruled slates.

The teacher rules the slates. The instruments recommended for slate ruling are a good ruler and a horseshoe nail. The teacher does not wait to notify the parents about the slate ruling. The slates are simply gathered and ruled at noon or night.

But no teacher without some previous practice should undertake the slate ruling in the presence of children.

It is recommended that the time of at least two recitation periods in the institute be occupied in ruling slates—spoiling them, perhaps.

Let a penny contribution be made by the institute and five or six good slates purchased on which members of the institute practice in the presence of the institute.

The instructor should first represent a slate on the blackboard and rule it carefully and accurately in the presence of the class, then rule an actual slate in full view of the class.

Every member of the institute not possessed of some skill should do some slate ruling in the presence of the institute.

“We learn to do by doing.”

The Size of Slates.

Seven inches by eleven inside the wooden frame is a convenient size. No child should be hampered by having to use a smaller size.

How to Hold the Slate Pencil:

Place the upper end of the pencil between the last two fingers. Let the thumb and fore-finger meet *above* the pencil near its point, and produce the pressure, while the ends of the second and third fingers support it farther back. This reduces the difficulty to a simple matter of leverage instead of pinching, as the fingers and thumb act in about the same way as when the pencil is held pen fashion. The thumb should not be bent inward. The pencil should be kept *from* between the ends of the thumb and fore-finger. Do not squeeze the pencil between the last two fingers nor press it against the little finger. Do not stiffen the little finger.

Remember: The pinching habit produced by holding the pencil pen-fashion is almost impossible to counteract when the children begin writing with a pen.

It is recommended that the teachers spend at least one recitation period discussing, and experimenting upon, how to use the pencil.

One recitation is not too much for the consideration of bodily positions at the desks and blackboard copies by the teacher, and the matter of the direction from which light is admitted. Whose eyes should suffer in facing the sunlight, those of pupils or teacher? May both be protected?

As to position, consider feet, body, chest, arms, hands, thumbs, wrists, slates, copybooks, paper.

Position from the outset is of vital importance. Whether for writing on slates or on paper the following directions should be considered and re-considered and enforced until the sight of a pupil violating one of them is painful to the teacher.

Directions: Face desk. Feet flat upon the floor. Sit clear back in the seat. Spinal column straight. Body erect; or, possibly, leaning slightly forward with a little weight on the left hand and fore-arm. Both fore-arms full length upon the desk and nearly at right-angles to each other. *Note:* Side positions in school seats are questionable.

One period should be devoted to movement in writing. With this the institute instructor is supposed to be familiar.

One or two periods should be devoted to pens, pen-holders and *pen-holding*.

Let the following directions be discussed and every teacher be required to *show* that he or she can illustrate them and easily detect violations of each of them.

Directions for pen-holding:

1. The end of the thumb presses against the pen-holder just opposite the first joint of the first finger.

2. The pen-holder crosses the first finger between the second and third joints.

3. The pen-holder crosses the root of the nail of the second finger.

4. The second and third fingers are separated at or near the second joint.

5. The tips of the nails of the third and fourth fingers rest upon the paper and support the hand.

One period should be devoted to form and slant of letters and the best manner of using our adopted copy books.

One period may well be spent in considering the analysis of letters. A very satisfactory plan used by many instructors is to select members of the institute class a day or two in advance and have them prepare five minute essays on the different phases of the subject under consideration.

Note.—Every member of the institute class ought to show in the

presence of the class that he or she has a plan of analyzing the letters. The teacher who cannot make a showing in the institute can not be trusted in a school; and teachers *unwilling* to make a showing in the presence of other teachers are likely to display about the same degree of professional fire and enthusiasm in the school room.

One period should be devoted to drawing. This should include among other things the off-hand skeleton work by which the teacher may so often without loss of time illustrate points during recitations.

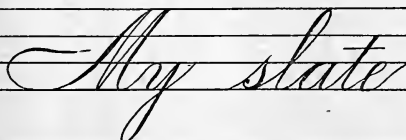
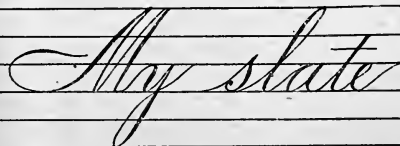
One lesson should be devoted to *The Mental and physical laws involved in learning to write*:

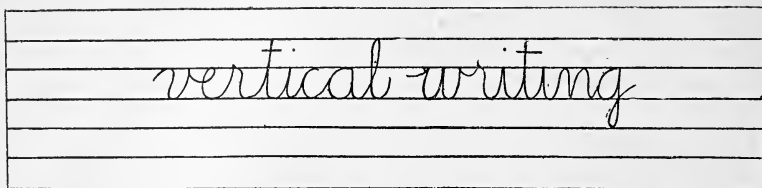
1. Controlled motion applied to the reproduction of mental images of correct script forms.

2. The eye sees, the ear listens, the mind gets the picture, the will directs, the nerve system receives the order and by use of the muscles reproduces the form.

3. Making a letter is at first a deliberate, conscious, often painfully conscious, act. Then it becomes easier. Then a page is written without conscious realization of the form of a letter. Here are some words: Conscious, voluntary, involuntary, reflex, automatic. These words may have meanings. You have written an entire letter to a friend and on reading it over have found words misspelled with which you were perfectly familiar. You have been disappointed because of having misspelled very common words. This fact teaches you something very wonderful about a certain servant of the soul. What is it?

Note: Since vertical writing is a serious problem and not a joke every institute ought to find time to give it some consideration.



NOTE: The delay in receiving the slate ruling from the engravers made it necessary to place the cuts at the *close* of the article, which was not contemplated by the author:

HISTORY.

BY PRIN. F. E. COOK, ST. LOUIS.

As a preliminary, a brief history of England should be studied Henry VII and Henry VIII.

Note: *Dates* and *maps* have been well called "the two eyes of History;" they are very necessary, especially the latter. Wall-maps are preferable to hand-made ones; and each lesson will be helped by having it preceded by map—pointing out.

The following few books of reference are recommended: "Barnes' Brief History of the United States," Montgomery's "Leading Facts," Eggleston's "School History," Higginson's "Young Folks' History of the United States;" for comprehensive reading, "Winsor's Narrative and Critical History," and for culture such as can be obtained no where else, "Hegel's Philosophy of History" (good English translation in Bohn's Library). This latter work is abstruse, and requires most patient study to glean its meaning; but, when mastered, it will be of supreme benefit to the student.

I. *Period of Discoveries.*

The carrying trade between the orient and occident in the fifteenth century was conducted mainly by what two rival cities of Europe? Describe the route of each to India. Which of these routes had just been closed as Columbus appears in history? What two inventions at this time made possible the navigation of the high seas? What was the great commercial problem of this age? What was Columbus' theory as to the earth's shape? Whence was this belief derived (by what experiences?—Foscanelli—Aristotle)—see John Fiske's "Columbus"? Date and describe minutely the four voyages of Columbus (routes taken, etc.—see John Fiske's Columbus). Vasco Da Gama (his great discovery—its date—its

effect upon the commerce of Europe? How came Portugal to claim Brazil? Who first proved Columbus' theory correct? (give sketch of his remarkable voyage—see John Fiske's *Columbus*”).

Who met? Who went? (See Barnes' *Brief History*, pp. 41–42). What mistake did he make as they found? What early conception as to the shape and extent of the new world was derived from the expeditions of Balboa, Magellan, Coronado and Espejo? This gave rise to expeditions to find what? What facts did DeSoto in North America and Pizarro in South America find, to disprove this conception as to the size of the new world, and thus encourage its settlement by Europeans?

Here should be learned a brief History of England (Elizabeth, Marie Stuart—James I., Charles I., Charles II.).

II. PERIOD OF SETTLEMENTS:—What four European nations undertook the Settlement of America? What were the main motives that prompted each in seeking possessions here? In what region did each locate?

When, where, and by whom was each of the English colonies settled? For what main purpose? What three forms of government prevailed in the colonies?

Describe each form, and tell which each colony had at one time or another.

Name the chief conditions and events in each colony, especially those which contributed to the framing of the American Constitution.

Note.—The teacher cannot impress too forcibly, the fact, that our Constitution is the outgrowth of colonial life; in the colonies are to be found the germinal leaves of our Union: this is a rich field for those teachers who will to work it.

Mention all the attempts at Union between parts of colonies, or entire colonies, prior to 1787.

Here continue a brief history of England (James II., William and Mary, Anne, and the two Pretenders).

III. *Period of Intercolonial Wars:*—Show how these wars, especially the last, paved the way to Union by removing local prejudices.

Give the date, causes, chief events of King William's war; also the title and terms of the treaty which concluded it. The same of Queen Anne's war (also its European title—why?) The same of King George's war. The French and Indian war:—Show what Champlain had to do with the forcing of his countrymen westward into the Mississippi valley, in their contest with the English. What steps did the French take to hold this valley against their enemy?

What five objective points had the English in this war? Speak of the importance of each. What was the general plan of the English? Date, title, and terms of the treaty by which this war was concluded?

What connection between the results of this treaty and the awaken-

ing of the spirit of resistance and revolution among the Americans towards the mother country?

IV. *The Revolution. (Causes):* Remote causes? Direct cause? What three attempts to tax the Americans, and under what prime minister was each? How was the repeal of each act brought about? Date, place of meeting, and proceedings of the Colonial Congress? Of the first Continental Congress? Of the second Continental Congress?

What was the effect of Washington's campaign in New Jersey (1776)? What was Burgoyne's plan? How frustrated? By whom? What was the effect of Greene's campaign in the Carolinas? Date, title and terms of the treaty by which the American revolution was concluded?

At this point the *substance* of the constitution of the United States should be carefully taught before the taking up of the administrations, which are but a *practical application* of its workings. But few of its clauses should be committed to memory, and these are, the preamble, the President's oath, the definition of treason, original and appellate jurisdiction of the Supreme Court, and the Supreme Law of the land.

As a prime means of cultivating the ethical and patriotic will, the biographies of our national heroes should be studied.

V. *The Administrations:*

1. *Washington:* Government started. Appointments and treaties (rev. cons.)—First political parties?

2. *Adams:* Alien and Sedition law?

3. *Jefferson:* Plain Democratic customs? Louisiana purchase? Embargo act?

4. *Madison:* War of 1812. (Cause?):—Perry; his flag ship (Name); his message to Harrison; connect his victory with the battle of the Thames. The Star Spangled Banner? How would the then existence of the Atlantic cable, have prevented a battle and changed our history?

5. *Monroe:*—"Era of good feeling?" Monroe Doctrine (J. Q. Adams)? Missouri compromise? Last of the "Continental" presidents.

6. *J. Q. Adams:* Connecting link between the past and modern presidents. High tariff (Clay).

7. *Jackson:* Nullification? Clay's compromise tariff? National bank troubles? (Explain).

8. *Van Buren:* Panic of 1837? Sub-treasury act?

9. *Harrison and Tyler:* Ashburton treaty (Webster)? National bank veto? Admission of Texas?

10. *Polk:* Mexican war—cause? Task set for each army. (Taylor, Kearney, Doniphan and Scott)? How completed? By what treaty

was this war concluded? Designate the territory thus acquired by the United States.

11. *Taylor and Fillmore*: Clay's Omnibus bill (its six provisions)?
12. *Pierce*: The Kansas-Nebraska bill (Douglas)?
12. *Buchanan*: The Dred Scott decision? The John Brown raid?
14. *Lincoln*: The Civil War: Name the three objectives of the Union in 1862? What was Grant's plan in 1864? What do you consider the ten most decisive battles of the war, whether on land or sea, and why? Emancipation proclamation? Assassination?
15. *Johnson*: His vetoes: (Freedman's Bureau? Civil rights bill? Tenure of office act?) Reconstruction trouble? Impeachment (rev. of cons)?
16. *Grant*: Treaty of Washington? Pacific railroad? Centennial? Electoral Commission?
17. *Hayes*: Withdrawal of troops from the South? Civil service reform? Resumption of Specie payments (John Sherman)?
18. *Garfield and Arthur*: Reduction of letter postage?
19. *Cleveland*: Presidential Succession law? (Hendricks).
20. *Benj. Harrison*: McKinley bill?
21. *Cleveland*: Wilson bill?

READING.

BY PRIN. GERTRUDE GREENE, KANSAS CITY.

GENERAL OUTLINE OF METHOD.

The teaching of reading has two sides:

- a. The mechanical side.
- b. The thought side.

MECHANICAL SIDE.

There is a mechanical side to the reading work which must be first acquired, and which must become, in a sense, automatic, before teachers can give their full attention to the study of thought. This consists of

1. A careful and persistent drill in proper position of body while sitting and standing.
2. Drill in position of book while pupil is sitting and standing.
3. Drills in rising and sitting.
4. Drills in proper breathing and the use of the vocal organs (Such drills can be found in any good elocution.)
5. Full instruction in use of diacritical marks, as a guide to pronunciation of new words.

6. Ready recognition and perfect articulation and pronunciation of words.

THOUGHT SIDE.

1. Careful study of the selection as to meaning of:
 - a. Words.
 - b. Sentences.
 - c. Paragraphs.
 - d. Selection as a whole.
2. Appropriate and pleasing oral expression of the thought

NOTE. If the "mechanical" difficulties have been carefully looked after, the expression of the thought can now receive the entire attention of teacher and pupils.

Discussions founded upon a careful study and practical application of preceding outline.

1. First day in the school room. A detailed outline of the first few lessons in reading.

2. Different methods of teaching beginners to read, viz: The *sentence* method, the *word* method, the *phonic* method, the *a-b-c* method, the *picture* method, and the *object* method; the *correct* method or combination of methods to use. Illustrate.

3. Discuss the work of the first reader; such as object of lessons, length of lessons, manner of preparing the lessons, method of conducting recitation, manner of obtaining correct expression, manner of teaching correct pronunciation of new words through a knowledge of the sound of the letters and the diacritical marks.

4. Give work in detail of a lesson in first reader. What should pupils know when the first reader has been completed?

5. Second and third reader lessons. What change in object of lessons? Seat preparation by pupils. Value of oral and written reproduction of thought contained in lessons.

6. When and how to begin the study of literature in reading classes. Value and place of supplementary reading in this connection. Indicate by some special lesson how pupils may be led to a real appreciation of literary excellence.

7. Object of a class criticism. Danger of indiscriminate class criticism. How can the matter be properly regulated by the teacher?

8. How to reach individual pupils:

- a. The pupil who stutters
- b. Who repeats.
- c. Who hesitates.
- d. Who articulates poorly.
- e. Who mispronounces.
- f. Who miscalls words.

- g. Who reads in a monotonous tone.
- h. Who reads with poor quality of voice.
- i. Who does not manage the breath properly.
- j. Who omits.
- k. Who reads in strained, unnatural tones.

9. Model lesson in advanced reading. Give details in the work of preparing and conducting such a recitation. How long a time might properly be given to the study of a selection in an advanced class?

Note. The *outline* is intended to serve as a general guide in planning and conducting a reading lesson. The points are merely suggestive. The live teacher will catch the spirit and use his own special plan in reaching results.

SPELLING.

BY PRINS. GERTRUDE GREENE AND F. D. THARPE, KANSAS CITY.

- Methods {
- 1. Phonic analysis.
 - 2. Naming of letters (oral spelling.)
 - 3. Written spelling.

1. Explain what is meant by phonic spelling; oral spelling; written spelling. When shall the teacher begin to teach spelling to beginners? What method shall he first use? Give in detail the work of a first lesson in spelling.

2. Relative value of oral and written spelling. How and when to teach abbreviations. Value of diacritical spelling. Method of conducting a recitation in diacritical spelling.

3. From what sources shall the words of each grade be selected? Seat work in preparation. Rules for spelling.

4. How to correct misspelled words. Value to child of study of meaning and use of words in spelling lessons, and the effect of the same on child's work in reading.

5. Test teachers in marking diacritically a list of words furnished by instructor. Test in pronouncing a list of words diacritically marked.

6. Define homonyms; synonyms. Value to child of such study. Illustrative lesson in each.

7. Value to child of a study of roots, prefixes and suffixes. Define each. Bring to class a list of ten words, showing meaning of as many prefixes in common use. A similar list showing use of ten suffixes.

8. Analyze a list of words furnished by instructor, giving root, prefix and suffix of each and meaning of each part.

9. A test in written spelling on a list of fifty words selected from daily paper by the instructor. Grade the list by reference to Webster's Dictionary and give a brief lesson on how to use the dictionary.

CIVIL GOVERNMENT.

BY SEPT. L. J. HALL, MONTGOMERY CITY

The first five lessons of the following outline and those relating to state government have been arranged chiefly according to the plan of "Barnard's Civil Government of Missouri." They can be prepared by reference to that work or any other good text book on the civil government of Missouri, or they may be learned directly from the constitution and statutes of the state.

I. *The School.* 1. Necessity and purpose; 2. School districts—their purpose, their shape; 3. Powers of the people; 4. School directors—their qualifications, their duties, vacancies in the board; 5. School funds, state, county, township, special, legislative appropriation; 6. The teacher, his qualifications, training and license.

II. *The Municipal Township.* 1. Purposes and formation; 2. Its relation to the county; 3. Officers—their qualifications, election, powers and duties; 4. Township organization—how adopted, name of officers and their qualifications, election, duties and powers.

III. *The Congressional Township.* 1. Distinguished from Municipal Tp. and its purposes given; 2. Townships—their description, division and sub-division; 3. Surveys—standard lines, marking lines, sections, corners; 4. Conveyances of lands.

IV. *The County.* 1. Its relation to the state; 2. County officers—their qualifications, election, principal duties, and compensation; official bond, tenure.

V. *Cities and Villages.* 1. Relation to the state and county; 2. General matters, including incorporation and division into wards; 3. Classes—first, second, third, fourth; 4. Take up each class—giving officers and their qualifications, election, terms, and powers; 5. Explain the legislative, executive, and judicial departments of each class.

VI. *State Government.*

Legislative Department. 1. Relation to the state, to the county, and to the national government as a unit of government; 2. General assembly—how composed, time of meeting, length of sessions, powers of each house, and compensation of members; 3. Representatives—qualifications, term, and districts; 4. Senators—qualifications, apportionment, term, classes, districts. 5. Legislative proceedings, legislative limitations and prohibitions.

VII. *Executive Department.* 1. Elective officers—governor, lieutenant governor, secretary of state, auditor, treasurer, attorney-general, superintendent of schools and railroad commissioners; 2. Qualifications, powers and duties of the governor; 3. Qualifications, powers, duties and bonds of other state officers; 4. Appointive officers—superintendent of insurance, adjutant-general, labor commissioner, warden of penitentiary, militia officers, state geologist, grain and tobacco inspector, oil inspector, commissioner of seat of government, state librarian, water melon inspector, *et al.*

VIII. *Judicial Department.* 1. Classes of courts—municipal, county, probate, circuit, court of appeals and supreme court; 2. Qualifications, election, and term of office of judges of the last three; 3. Common pleas and criminal courts; 4. Jurisdiction of each of the classes of courts, term, and compensation of judges.

IX. *Rights and Duties.* Study carefully the Bill of Rights of the Constitution of Missouri.

Citizenship and Suffrage. 1. Citizenship—naturalization rules and exceptions, rights conferred by citizenship, duties; 2. Suffrage—by whom conferred, state or national authority? 3. Voting a duty.

X. *Elections in Missouri.* 1. Time and place of holding elections; 2. Two classes of voters and their qualifications; 3. Who may not vote? 4. Method of conducting the election; 5. Australian Ballot System: nominating candidates, method of voting in full.

Party Management. 1. Necessity for parties; 2. Committees—national, state, county and other; 3. Conventions, county, state, national, district.

XI. *Revenue and Taxation.* 1. Necessity for revenue and principles governing its collection; 2. Kinds of taxes—customs and internal revenue; 3. State taxes—assessment, rates for state, county, and city purposes; 4. Method of collecting taxes.

XII. *State Institutions.*

1. *Educational.* a. The University of Missouri; b. Normal Schools—Kirksville, Warrensburg, Cape Girardeau; c. Lincoln Institute.

2. *Eleemosynary.* a. Deaf and Dumb Institute (Fulton); b. Institute for the Blind (St. Louis).

3. *Industrial Schools.* a. For Boys, at Boonville; b. For Girls, Chillicothe.

4. *Asylums for the Insane.* a. No. 1, at Fulton; b. No. 2, at St. Joseph; c. No. 3, at Nevada.

5. *The State Penitentiary.* (Jefferson City.)

Give the method of control of each of the above institutions.

XIII. *United States Government.* 1. The colonial union; 2. The confederation; 3. The union under the constitution—necessity, purpose, formation.

XIV. *Congress. House of Representatives:* 1. How composed; 2. Eligibility; 3. Election; 4. Congressional districts—gerrymander; 5. Powers, duties and privileges.

XV. *Congress. The Senate:* 1. Composition; 2. Term; 3. Election; 4. Classification; 5. Organization; 6. Powers. a. Legislative; b. Executive; c. Elective; d. Judicial.

XVI. *Congress.* 1. Membership; 2. Ineligibility; 3. Quorum; 4. Rules; 5. Journal; 6. Penalties; 7. Prohibitions; 8. Salaries.

XVII. *Executive Department.* 1. In whom vested; 2. How elected—electors; appointment, number, proceedings; 3. Oath; 4. How removed; 5. Salary; 6. Powers and duties.

XVIII. *Judicial Department.* 1. Where vested; 2. Appointment of judges; 3. Qualifications; 4. Tenure; 5. Salary; 6. Privileges; 7. Supreme court—sessions, jurisdiction, powers, duties.

TOPICS FOR GENERAL DISCUSSION.

1. The purpose of government.
2. The American idea of trusting the people.
3. State sovereignty.
4. Civil service reform.
5. Federal judges should be elected by the people.
6. The single, or land tax.
7. Our financial system.
8. Election of United States senators.
9. Purity of the ballot. How secured.
10. Our school system. (Missouri.)

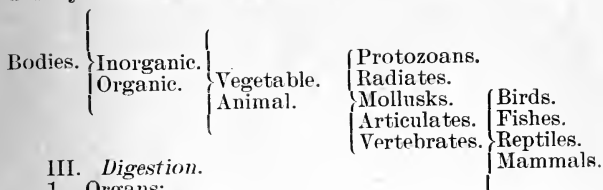
PHYSIOLOGY.

By PRES. W. D. VANDIVER, CAPE GIRARDEAU, AND PROF. N. A. HARVEY,
KANSAS CITY.

I. Explain the distinctions between Anatomy, Physiology and Hygiene. Show the importance of each. Show that their scientific study should be in the order named, while their practical value is in the reverse order. Hence, lessons on Hygiene should be introduced in the lower grades, and the fundamental laws of health should be taught to all pupils, but the scientific study of Anatomy and Physiology should be reserved for the high school, and only so much of them taught in the elementary school as may be necessary as a foundation for Hygiene.

II. Show the position of man in nature, or relation to the animal

kingdom. The following diagram is perhaps the simplest method of classification, though it is an old one and the recent writers on Zoology usually make seven instead of five sub-kingdoms as here indicated:



III. Digestion.

1. Organs:

- a. Mouth;
- b. Pharynx;
- c. Oesophagus;
- d. Stomach;
- e. Intestines—Large, small.

Suggestive Questions:• Can one breathe while swallowing? Try it. Can one swallow with head downward? Explain it. Place fingers on throat and swallow. What motion is felt? Estimate the capacity of the stomach by what a healthy person is known to have eaten and drunk at one time.

What is the order of muscular contraction in swallowing? Suppose that order be reversed; what is the result?

IV. Digestion.

1. Processes:

- a. Prehension;
- b. Mastication;
- c. Deglutition;
- d. Chymification;
- e. Chylification;
- f. Absorption.

Suggestive Questions: Where are the salivary glands? Can you find them? Can you find the opening of some of them under the tongue? What use is made of the saliva in chewing tobacco? Trace a portion of a biscuit, spread with butter and sugar, from the mouth to the heart.

V. Teeth.

1. Kinds: a. Incisors; b. Canines; c. Bicuspedes; d. Molars.
2. Number of each:
3. Composition.

Suggestive Questions: With a mirror can you count your own teeth? How many of each kind have you? Can a cat move its jaws sideways? Can you? Are the cat's back teeth like yours? How does the cow move her jaws? What is indicated by prominent canine teeth? Which of your teeth have been displaced by others? When? Can tooth-ache be avoided?

VI. *Circulation.*

1. Organs:

- a. Heart—chambers, valves;
- b. Arteries;
- c. Capillaries;
- d. Veins.

2. Blood—Corpuscles, Plasma, Temperature.

Suggestive Questions: The tail of a minnow, the tail of a tadpole, and the web of a frog's foot will show the blood corpuscles moving in the capillaries if a good microscope can be procured and used.

Find the pulse in the wrist, in the elbow, on the side of the neck under the lower jaw, in the temple. Wrap a string tightly around one finger, describe at all without moving your ribs? What muscles produce these movements? Are the lungs active or passive in breathing.

VII. *Respiration.*

1. Organs:

- a. Larynx;
- b. Trachea;
- c. Bronchial Tubes;
- d. Lungs.

Suggestions: Breathe in as much air as possible. Then breathe out as much air as possible. Class, do this all together. Measure the difference in size of the body under the arms. Do the ribs move? Can you breathe at all without moving your ribs? What muscles produce these movements? Are the lungs active or passive in breathing?

Shake some slacked lime in a tumbler of water. After it has settled pour off the clear part. This is lime water.

Carbon-di-oxide will turn lime water white.

Breathe through a straw into some lime water. What does this show as to the breath?

When there is a thin moist membrane with blood containing carbon-di-oxide on one side and oxygen on the other, an exchange of gases will take place. Show how all of these conditions are fulfilled in the lungs.

VIII. *Voice.*

1. Organs:

- a. Larynx—Cartilage, vocal cords, epiglottis.

Suggestive Questions: Put your thumb on the larynx. Swallow. What do you observe? Observe the movement of the larynx, if any, while talking.

Make a pasteboard tube one inch in diameter and ten inches long. Tie tightly over one end of it a piece of sheet rubber, which can be obtained from a dentist or possibly from a drug store. Make one cut with a knife blade through the middle of the rubber. Blow through the tube

from the open end. This will represent the manner in which the voice is produced by the vocal cords.

What change occurs in singing the scale?

IX. *Muscles.*

1. Definition;
2. Number;
3. Kinds;
4. Uses.

Suggestive Questions: Bend the arm. Feel what change occurs above the elbow? What causes the change? What produces the movement? Straighten the arm. What causes this movement? Does one muscle produce both movements? Grasp the right forearm with the left hand. Work the fingers and thumb of the right hand. What bends the fingers? What straightens them? Place the fingers of the left hand firmly in the bend of the right elbow? Move the right forearm up and down. Do you feel a muscle? If not, what is it? Where is it attached?

X. *Joints.*

1. Definitions;
2. Kinds;
3. Parts;
4. Uses.

Suggestive Questions: Get from the butcher either a knee joint or a shoulder joint. Observe the muscles by which it is worked? Discover how these muscles are attached to the bone. What holds the two bones together? Examine the ends of the bones. Feel of them and say whether it is bone you feel or something else. Observe the shape of the ends of the bones.

XI. *Nervous System.*

1. Parts.
 - a. Nerves:
 1. Kinds—Motor and Sentient;
 2. Origin.
 - b. Spinal Cord;
 - c. Brain;
 1. Coverings.
 2. Parts.
2. Structure
3. Function.

Suggestive Questions: Without looking, lower your hand till it touches the desk. When it touches the desk raise it. What cause from without you, induced you to lower your hand? How did that cause get to you? What was the immediate cause of your hand beginning to lower? What was the physical force which did actually lower your hand?

Explain the cause and force operating to raise your hand? Can you illustrate the difference between nervous impulse and muscular contraction? Does the heart beat in consequence of the same kind of impulse? What causes the sensation the "foot asleep?" In lowering your hand a few minutes ago, suppose you had touched a hot iron instead of the desk, would the impulse by which you raised your hand, have been the same? Whether right handed or left handed, how did you come to be so? Does the brain have anything to do with it?

XII. *The Eye.*

1. Parts:

2. Protecting Organs.

Suggestive Questions: How does the dipper handle in the bucket of water look? Is it as it appears to be? Explain.

It is suggested that the instructor should not attempt to proceed without a lens, a prism, or some other actual means of showing the refraction of light.

Each member of the institute should draw a section of the eye cut through vertically from back to front showing the coats and humors. What is the form of the eye of a near-sighted person? Draw it. What kind of spectacles does such a person wear? Why? While standing before a mirror in a darkened room hold a lamp or candle back of the head for a moment, then quickly bring it in front of the face watching the pupil of the eye. Explain the change in the eye.

Hold a prism in the sunlight, then hold paper or cloth of different colors in the spectrum thus formed. What changes occur in the paper or cloth? Why? It is suggested that either an actual eye of an ox obtained from a butcher or a model obtained from a physician will be highly useful in this lesson.

XIII. *The Sense of Hearing.*

Parts of the ear:

External—Cartilage, Tympanum:

Middle;

Internal—Ochlea, Semi-circular Canals.

Suggestive Questions: Close the nose and mouth and blow moderately hard. Tell what you feel and tell what causes it.

Have you ever whirled around until you were dizzy? What part of the ear is affected in this dizziness? In what part of the ear do the auditory nerves terminate and how do they terminate? By what means do we distinguish between tones as to pitch, quality, and loudness?

XIV. *The Skin.*

Layers—Epidermis, Dermis:

Appendages—Hair, Nails.

Suggestive Questions: At which end does the hair grow? Does it

hasten the growth of the hair to cut the ends off?

Where are the sweat glands? At which end of the nails does growth occur? How do we catch cold? What is the purpose in bathing?

XV. *Diseases.*

Tell what part of the body is affected in each of the following diseases:

Bronchitis, Laryngitis, Pericarditis, Peritonitis, Appendicitis, Meningitis. Note: Any disease indicated by the ending *itis* implies inflammation. What is inflammation?

What part of the body is affected by Pleurisy, Pneumonia, Goiter, Catarrh, Neuralgia, Rheumatism, Sciatica, Gout, Mumps? What is Consumption? Measles? Smallpox? What are the symptoms of a fever?

XVI. *Secretion.*

Glands. Locate the pancreas, liver, salivary glands, kidneys, spleen, gastric glands, sweat glands, oil glands, lachrymal glands. Note: The product of a gland is called its secretion. What does each of the above mentioned glands secrete? Of what use is the secretion of each?

XVII. *Effects of Alcohol and Narcotics.*

1. Effect of strong alcohol upon watery tissues.
2. Upon the white of an egg, pour an ounce of alcohol. Note the effect.
3. Put an earthworm into strong alcohol. After it has remained 24 hours, examine the condition of the earthworm. Has the alcohol hardened the animal tissues?
4. Discuss the scientific uses of alcohol.
5. Of what and how are alcohol, beer, and wine made?
6. What is meant by the drink habit? How may it be cured?
7. Discuss the effect of tobacco on growing children; on adult persons.

XVIII. Have each member of the class prepare and bring to the class ten well known and clearly demonstrable rules of health which the pupils of every school should be taught to practice.

Suggestive Questions: What effect on the health of pupils is produced by having the stove in the center of the schoolroom and the room heated by direct radiation? What effect is produced by a stovepipe running along over the heads of the pupils? Why is the stove in a railway car not placed in the middle of the car? Why not sit in a draft? In what part of a room is the air warmest?

Why not have the water used by the school children brought from a pond or a well which has not been used during the summer? Why not allow the milk cow to drink from a pond at the lower end of the barn lot?

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